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VIA CERTIFIED MAIL/R.R.R.

September 7, 2022

Laura J. Rowley, Senior Trial Attorney
U.S. Department of Justice
Environment and Natural Resources Division
Environmental Enforcement Section
P.O. Box 7611
Washington, DC 20044-7611

Re: Occidental Chemical Corporation v. 21st Century Fox America, Inc., et al.
Civil Action No. 2:18-cv-11273
PMC Global, Inc. Allocation of Liability

Dear Ms. Rowley:

This firm represents Defendant PMC Global, Inc. ("PMC") in the above-captioned litigation. Exemption (b)(7)(A)

Exemption (b)(7)(A)

637460

Exemption (b)(7)(A)

Exemption (b)(7)(A)

Exemption (b)(7)(A)

Exemption (b)(7)(A)

Exemption (b)(7)(A) Accordingly, please contact my partner Anthony Reitano or me to discuss how to proceed going forward.

Thank you for the opportunity.

Very truly yours,

/s/ Craig S. Provorny
Craig S. Provorny

Enclosures
cc: Anthony J. Reitano, Esq. (w/encls.)
PMC Global, Inc. (w/encls.)
Eric Wilson, Deputy Director for Enforcement
and Homeland Security (w/encls.) (via cert. mail/r.r.r.)

Exhibit A

Tri-Tech Environmental Engineering, Inc.
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973-366-2020 • Fax: 973-366-0496
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Visit our website at: www.tritechglobal.com

Site Investigation Report
ISRA Case # E20000117

Site:
Kleer Kast Division of PMC, Inc.
450 Schuyler Avenue
Kearny Twp., NJ 07032

Volume 1

Narrative, Figures, Tables, Appendix A

Prepared for:
PMC, Inc.
501 Murray Road
Cincinnati, Ohio 45217

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APPENDICIES

1.0 INTRODUCTION/TECHNICAL OVERVIEW

Tri-Tech Environmental Engineering, Inc. (Tri-Tech) has been retained by Kleer Kast, Division of PMC, Inc. to conduct a Site Investigation (SI) pursuant to the New Jersey Technical Requirements for Site Remediation (N.J.A.C. 7:26E) and under the Industrial Site Recovery Act (ISRA). Initial SI sampling was conducted concurrently with the Preliminary Assessment (PA) phase with additional site investigation sampling conducted at later dates. Remedial Investigation activities have been initiated at the site, however this data is not presented within this report and is forthcoming in a separate Remedial Investigation Report (RIR).

2.0 SITE CHARACTERIZATION

The site is located in a commercial/industrial area of Kearny, Hudson County, New Jersey, at 450 Schuyler Avenue. A site location plan based on a portion of the United Geological Survey (USGS) Orange, New Jersey 7.5-minute topographic quadrangle is presented as **Figure 1**. The eastern most portion of the property is undeveloped marsh areas and wetlands.

A portion of the site was characterized by the New Jersey Department of Environmental Protection (NJDEP) as "NJDEP Chromate Site No. 53". The location is identified as Tax Lot 11, Block 226, a portion of the subject site. It should be noted that no subject site owners or operators are Responsible Parties to the NJDEP Chromate Site No. 53. In fact, it is the understanding of PMC that this case has been closed and that no further action has been planned for NJDEP Chromate Site No. 53 at Tax Lot 11, Block 226.

A site plan is presented as **SP-1A.**

The property is bordered to the south by Quincy Place, by Ace Auto Wrecking, an automotive scrap yard, to the north; Conrail tracks to the east; and by Schuyler Avenue to the west.

2.1 Historical Information

Tri-Tech researched historical information including Sanborn Fire Insurance Maps and aerial photographs of the Site. It should be noted that Sanborn Maps for the facility are reported as 1950, 1985, 1991, 1993, and 1994 only. Additionally, all maps indicate, "Admittance Refused" for the Site.

2.1.1 Joseph Davis Plastics Company

The earliest use of the Site was found to be the Joseph Davis Plastics Co. The Joseph Davis Plastics Co. is identified on the 1950 Sanborn Map as a "Pyroxylin Plant".

Pyroxylin is defined in the *"Dangerous Properties of Industrial Materials"*, Seventh Edition, Sax/Lewis, as a synonym for Cellulose Tetranitrate (CCU250). Cellulose Tetranitrate is a flammable solid, with a high dangerous fire hazard when in the dry state. Former worker accounts indicate that the activity ceased in the early 1950's. By about 1960 Joseph Davis Plastics was conducting operations similar in type to those conducted by Kleer Kast.

2.1.2 King Finishing

King Finishing, A Subsidiary of PMC, Inc. was a tenant during the specified period. Manufacturing operations were limited to Building #7. King Finishing operations included the water washing of metal parts in a phosphate wash tank system and coating the parts in a powder coating operation. King Finishing ceased operations in April 2000. A GIN was filed and ISRA Case # E20000116 was assigned by the Department.

2.1.3 Alexandria Plastic, Inc.

Alexandria Plastic Inc. was a tenant during 1992 through June 1995. Their leasehold area was limited to Building No. 6. Alexandria ceased operations at the subject site on or about June 1995. Alexandria Plastic submitted a GIN and the Department assigned ISRA Case #95230 for that cessation of operations.

In a letter dated March 18, 1997, the NJDEP, BFO advised Alexandria Plastic that a Preliminary Assessment must be submitted. Kleer Kast understands that Alexandria Plastic has not submitted the PAR. It is unknown whether Alexandria Plastic is in operation at another location. The Alexandria leasehold area is being investigated as part of this SI.

2.1.4 Kleer Kast

Kleer Kast is a manufacturer of cellulose acetate sheet and compounded materials for eyeglass frames, map overlays, sheet protectors, film leaders and various graphic art sheet materials. The acetate sheet manufacturing involved the mixing of cellulose acetate resin (power) with acetone and various plasticizers (phthalate compounds) to make a dope solution. This solution was extruded into sheet goods in a band casting operation. Once dried of the solvent content the finished clear cellulose acetate sheet was wound onto rolls. The roll goods were finished in various ways. The wide sheet goods were cut in the slitting operation into smaller widths to meet customers' needs.

The acetone solvent driven off the sheet manufacturing was collected in carbon adsorbers and recovered in a distillation operation. This system was subject to the air pollution control standards and operated under an air discharge permit. The band casting operation was water-cooled. An NJPDES permit was in place at the facility to control the quality of the water before direct discharge.

The compounding operation involved the dry blending of various plastic resins, plasticizers and other compounds in blenders. The blended solid mixture was then added to an extruder and extruded as strings. The strings of cooled material were then mechanically chopped to form pellets. The pellets were either used in other extrusion operations in-house or sold as the prepared compounded pellets for their customers use. The cooling water from this operation was in contact with the hot plastic and was therefore directed to the sanitary sewer connection for discharge under permit by the Passaic Valley Sewerage Commissioners.

Two in-house operations to yield different end products were the optical department and the press polishing operation. Cellulose acetate compounded pellets were extruded into thick sheets of material. This material was sold to customers who cut eyeglass frames from the sheets. Press polishing takes cellulose acetate clear sheets and polishes the surface of the sheet under high compression. The finished material is typically used for optically clear face shields or lenses.

2.1.5 Additional Tenants/Operators

S & J Electrical Contractors Co., Inc. (West End – Building #16)

S & J Electrical Contractors Co., Inc. was a tenant during the specified period. S & J is an electrical contractor and utilized the leasehold area for the warehousing of electrical parts and supplies.

Superior Stamp & Die Works (West End – Building #2)

Superior Stamp & Die Works was a tenant during the specified period. Superior is a manufacturer of steel stamps. Operations are limited to the leasehold area only.

LMC Tool & Machine Company (East End – Building #16)

LMC Tool & Machine Company was a tenant during the specified period. LMC Tool & Machine is a general machine shop with typical operations including metal drilling, cutting, bending, forming, welding, threading, tapping, etc. LMC also provides vehicle repair services.

Winkler Mfg. (Bldg #6, 20-A, 20-B, & Bldg #20-C)

Winkler Forming Inc., a Subsidiary of PMC, Inc. was a tenant during the specified period. Winkler used the leasehold area for warehousing of non-hazardous, plastic packaging only. Winkler did not conduct any manufacturing operations at the site. Therefore, the Winkler operations are not ISRA applicable.

Pathways To Independence (Bldg 2 – Upper Level)

Pathways to Independence employs handicapped and mentally challenged individuals to perform light packaging operations. By nature of the employees, Pathways does not utilize any hazardous materials and utilizes no manufacturing operations.

2.2 Physical Setting

A site location map based on the United States Geological Survey (USGS) Lakehurst, New Jersey 7.5-minute topographic quadrangle is enclosed as Figure 1. The site is moderately to gently sloping east. The change in elevation from the west to east property line is approximately 15 to 20 feet. According to the USGS Orange, New Jersey 7.5-minute topographic quadrangle, the topography of the western most portion of the site is approximately 20 to 22-feet above mean sea level (MSL).

2.3 Site Geology

The site is located in the Piedmont Physiographic Province of New Jersey, specifically the site is located within the Newark Basin formed in the early Mesozoic era. The Newark Basin extends from the Hudson River Valley to the divide between the Schuylkill and the Susquehanna Rivers in Pennsylvania. The early Mesozoic basins formed by downfaulting that accompanied rifting of the Earth's crust in the Triassic and Jurassic Periods during incipient stages of continental breakup and are filled mostly with thick sequences of sedimentary rocks. For the most part, major faults border the basins on the west and northwest, and the predominant direction of dip of the sedimentary rocks in the basins is toward these major border faults.

The lower Mesozoic rocks lie unconformably on Precambrian and Paleozoic crystalline rocks, and locally on Paleozoic sedimentary rocks in New Jersey. Sedimentary rocks in the basins consist predominately of interbedded shale, sandstone, and siltstone, all typically red, reddish brown, or maroon but locally gray or black. Conglomerate, dolomite, lacustrine black mudstone, and coal are present locally. In many places, the sedimentary rocks are interbedded with basalt flows and/or have been intruded by diabase dikes and sills. A combination of intermittent faulting and subsidence of the basins, altitude of the bordering highlands, climate, and drainage patterns controlled deposition of sediments in the early Mesozoic basins. A tropical climate prevailed in the basins during Triassic and Jurassic time. Temperatures were high and rainfall varied, but tended to be low. Sediments deposited in lakes later became siltstone and mudstone, those deposited in swamps became black mudstone and coal, and river deposits and alluvial fans became sandstone and conglomerate. Lake levels varied; some lakes dried up seasonally, and the exposed sediment was oxidized and turned red. The sediments show evidence of cyclic repetition due to periodic changes in the climate.

The Newark Basin contains three principal stratigraphic units. From oldest to youngest, these are the Stockton Formation of Triassic age, which is mainly soft feldspathic sandstone, shale, and some conglomerate; the Lockalong Formation of Triassic age, which is predominately gray and black siltstone and shale; and the Brunswick Group of Jurassic and Triassic age, which contains argillite, shale, siltstone, sandstone, conglomerate, and three basalt units. According to the USGS, 1996 Bedrock Geologic Map of Northern New Jersey, the western most portion of the site is underlain by sandstone (JTrps) and the eastern most portion of the site is underlain by the sandy mudstone (JTrpms) of the Passaic Formation of the Brunswick Group. Immediately west of the western most property boundary, approximately underlying Schuyler Avenue is an intrusive sill of diabase.

The sandstone (JTrps) underlying the site is described as interbedded grayish-red to brownish-red, medium to fine grained, medium to thick-bedded sandstone and brownish to purplish red coarse-grained siltstone. The silty mudstone is described as a reddish-brown to brownish red, massive silty tc sandy mudstone and siltstone. This rock is generally ripple cross-laminated and interbedded with lenticular sandstone. Rocks of the Passaic formation have been locally thermally metamorphosed to hornfels where in contact wit the basalt, diabase dykes and sheet like intrusions. The total thickness of the Passaic Formation reportedly ranges from 11,480 to 11,810 feet.

- Site specific geology encountered during fieldwork indicated shallow sedimentary bedrock in the Alexandria Area at approximately five feet below the building floor.
- Soil encountered at the site consisted of reworked native soils and fill material ranging from fine silty sand to clayey silt and ash/cinder type material. Evidence of chromate waste was observed in the loading dock area and along the east side of the property.

2.4 Site Hydrogeology

The Newark Basin in New Jersey and Pennsylvania is the largest Mesozoic basin and the one from which the most ground water is withdrawn. Groundwater in the Passaic Formation is found under water table, semi-confined and confined conditions. Groundwater occurs in the pore spaces of the sediments and fractures with the more competent rock. Bedding planes and faults may contain significant groundwater. Fault zones themselves commonly have low permeability because they can be filled with clay gouge, recemented breccia, or recrystallized rock, all of which impede the flow of ground water. Most of the water-bearing fractures in the Piedmont are joints, stress-relief fractures, or cleavage planes and are not directly associated with a fault. Some fracture zones appear as lineaments that can be identified on aerial photographs.

The aquifers in early Mesozoic basins are mostly sandstone, siltstone, and shale, with some limestone and conglomerate. The minerals that compose these rocks are slightly more soluble than those of the rocks that compose crystalline-rock and undifferentiated

sedimentary-rock aquifers. Dissolved-solids concentrations in water from the aquifers in early Mesozoic basins average about 230 milligrams per liter, and hardness averages about 160 milligrams per liter, which is considered to be hard. The median hydrogen ion concentration, which is measured in pH units, is 7.6. The dissolution of calcium and magnesium carbonate raises the pH of the water and renders it less acidic. Chloride and sulfate concentrations average about 12 and 29 milligrams per liter, respectively, but chloride concentrations as large as 1,400 milligrams per liter and sulfate concentrations as large as 1,200 milligrams per liter have been reported in water from deep wells. The median iron concentration is 0.1 milligram per liter, but concentrations as large as 5.3 milligrams per liter have been reported. The water from the aquifers in early Mesozoic basins is mostly a calcium bicarbonate type.

Groundwater was encountered from 0.5 to 2.5 feet below grade during soil boring activities. Groundwater levels at the site are anticipated to fluctuate based on seasonal precipitation.

Groundwater seeps on the west side of the Site are responsible for generating a percentage of the surface water within the sump/pits throughout the buildings. Due to the cut and fill construction practices at the site along Schuyler Avenue to the west and the automotive scrap yard to the north, groundwater seeps and surface flow is intercepted by the building foundation and floor. Groundwater within the western most portion of the property, flows above the building floor when not controlled with pumps. Building 20-C becomes flooded during precipitation events.

2.5 Receptor Evaluation

Wetlands and marsh areas exist on the east portion of the site and further off-site to the east. An area of the Site is within in the NJDEP Chromate Waste Site 53. According to the United States Department of the Interior National Wetland Inventory Map for the Orange, New Jersey Quadrangle, the wetlands along the east side of the Site are classified as E2EM, Estuarine, Intertidal Emergent Wetlands. Dominant vegetation in emergent wetlands consists of tall Smooth Cordgrass (Spartina alterniflora), short Smooth Cordgrass S. alterniflora), Marsh Hay (Spartina patens), Salt Grass (Distichlis spicata) and Cattail (Typoha angustfolia).

2.5.1 Wellhead Assessment

Two former production wells are located on the Site. One well is located on the west side of the Site along Schuyler Avenue and the second is located within the boiler house. These wells are believed to have exceeded 300 feet in depth each and were abandoned in 1998. These wells were screened within the bedrock beneath the site. Copies of the well abandonment forms were previously submitted with the PAR.

2.5.2 Drainage

The Site is located in the Hackensack River drainage basin. The portion of the Hackensack River located nearest the Site is classified as Saline Estuary 2 (SE2), under N.J.A.C. 7:9B, the Surface Water Quality Standards. Drainage on the Site is either by overland flow or storm water catch basins. Two ponds are located on the site. The first pond is located to the east of Building 20F and appears to receive storm water flow from along the north side of the building and the auto wrecking yard to the north. A second pond is located to the east of building 20C and the asphalt cap extending from this building to the bordering vegetation. This pond receives storm water from with the site and was formerly the outfall for a contact/non-contact cooling water discharge (NJPDES Permit No. 0031313).

As indicated previously because of the Site topography and building construction/location, a series of pumps and basins are located throughout the buildings to remove surface water borne from seeps in the upslope direction and overland flow. Kleer Kast reported that as additional development occurred along Schuyler Avenue over the last 20 years, that an increase in groundwater/surface water flow has been apparent. Additionally, the automotive scrap yard to the north of the facility is located approximately 15 feet above the floor grade of the Site buildings.

2.5.3 Underground Utilities

The Site is serviced by water and sanitary sewage services provided by the City of Kearny. A sanitary sewage lift station is located on the east side of the boiler building. Sanitary sewage is pumped up to the main lateral beneath Schuyler Avenue and processed by Passaic Valley Sewage Commission.

3.0 TECHNICAL OVERVIEW

3.1 Reliability of Analytical Data

Sampling activities were performed in accordance with the requirements outlined in the *NJDEP Field Sampling Procedures Manual*, May 1992, and N.J.A.C. 7:26E. All samples were maintained under chain of custody documentation through delivery to STL Edison, Edison, NJ, a NJDEP certified laboratory (#12028).

The data quality assurance deliverables conform to the Reduced Deliverables as specified in N.J.A.C. 7:26E. Samples collected for VOCs were analyzed analysis were analyzed using United States Environmental Protection Agency (USEPA) Method 8260B (soil)/624 (groundwater); for BNs by USEPA Method 8270 (soil)/625 (groundwater); PCBs by USEPA Method 8082; and for PPMetals by various methods.

3.2 Site Contamination Summary

Contaminants of concern at the site consist of chlorinated hydrocarbons, petroleum hydrocarbons, polyaromatic hydrocarbons, phthalates and heavy metals.

3.3 Significant Events and/or Seasonal Variation Influencing the Investigation

Historically a series of sumps throughout the building were used to dewater the building and maintain the water level below the floor. These pumps were running until approximately April 12, 2001. Preliminary sampling at the site, specifically, within the Alexandria area was biased towards the water level encountered beneath the floor. Subsequent sampling in this area revealed the water table immediately beneath the floor. Sampling was biased towards the saturated interval based on the absence of dry soil above the water level.

3.4 Identification of Applicable Remediation Criteria

Kleer Kast has agreed to place appropriate deed restrictions on the property in order to use the Restricted Use Soil Cleanup Criteria where appropriate. Groundwater at the site is currently considered to be Class IIA in accordance with NJAC 7:9-6. However, further investigations at the site may indicate that a petition for reclassifying the groundwater is appropriate. Evaluation of the applicable remediation criteria will be ongoing at the investigation at the site progresses.

4.0 SITE INVESTIGATION

A site location plan showing the Areas of Environmental Concern identified during the PA is enclosed as SP-1E. A Sample Summary Table is included as **Table 1.**

4.1 Bulk Storage Tanks and Appurtenances

4.1.1 AEC 1: Former Acetone Storage Tanks

AEC 1 consists of two former 5,000-gallon and one former 10,000-gallon acetone aboveground storage tanks (ASTs) formerly located at the southeast corner of Building No. 16. The tanks were formerly located in a concrete containment dyke measuring 54 feet long by 31 feet wide and were elevated on saddles.

On July 17, 2000, Tri-Tech conducted eight soil borings in this AEC. Six soil samples (S-1-1 through S-1-6) were collected from the four sides of the containment dyke. Soil sample locations are illustrated in **Figure SL-1**. One additional soil sample (S-1-7) was collected approximately 28 feet to the east of the former containment dyke. Soil samples were collected from six-inch intervals between 1 to 2.5 feet below grade, at 0 to 6 inches above groundwater. Groundwater was encountered at 2 to 3 feet below grade.

Four of the seven soil samples registered non-detectable (ND) for acetone. Samples S-1-1 and S-1-6 registered 1.0 and 5.0 ppm, respectively. Acetone was not detected above the most stringent NJDEP SCC of 100 ppm for Impact to Ground Water. The soil sample results are summarized in **Table 2** and the laboratory analytical data is enclosed in **Appendix A.**

Three groundwater samples (GW-6, GW-7 and GW-8) were collected at sample locations S-1-1, S-1-7 and GW-8, respectively. These sample locations are on the east side or apparent downgrade side of the former acetone tanks. Groundwater was encountered at 2 to 3 feet below grade. Samples were collected in accordance with the NJDEP Alternative Ground Water Sampling Technique Guidelines, July 1994. Specifically, a temporary, one-inch diameter PVC well screen was placed into the open borehole, purged of three to five well volumes and sampled.

Sample GW-6, at soil sample location S-1-1, registered 200 parts per billion (ppb) acetone, which is below the NJDEP Groundwater Quality Standard (GQS) of 700 ppb for Class IIA aquifers. Groundwater samples GW-7 and GW-8 both registered non-detectable for acetone. Additional VOCs were detected but were below the NJDEP GQS. The groundwater sample results are summarized in **Table 3** and the laboratory analytical data is enclosed in **Appendix A.** On the basis of the site investigation sampling conduced, **NO FURTHER SAMPLING OR ACTIONS** are proposed for AEC 1.

4.1.2 AEC 2: Inactive Vertical Plasticizer Storage Tanks

There are four 3,000-gallons ASTs present within a concrete containment unit at the east side of building 16. The tanks formerly contained diethyl phthalate (DEP) and dimethylphthalate (DMP). The tanks were previously emptied and cleaned.

On July 14, 2000, Tri-Tech conducted soil borings on each side of the containment unit. Soil samples were collected in discreet six-inch intervals 1.5 to 2.5 feet below grade at 0 to 6 inches above groundwater. Soil samples (S-2-1, S-2-2, S-2-3 and S-2-4) were analyzed for BN+15. Sample S-2-3 registered DEP at 310 ppm, which exceeds the NJDEP SCC for Impact to Groundwater of 50 ppm.

One groundwater sample (GW-5) was collected from the east side (apparent downgrade side) of the containment dyke (refer to **Figure SL-2** for sample location) using a temporary one-inch well point advanced to approximately six feet below grade. Laboratory analysis registered 4,500,000 ppb of DEP, which exceeds the NJDEP GQS of 5,000 ppb.

On October 5, 2000, four corings were advanced through the concrete floor of the containment dyke to collect soil samples. Upon coring of the concrete, the soil beneath the pad was found to consist of gravel, which appeared to have been placed there for the purposes of constructing the concrete pad. A hand auger was used to attempt to collect soil samples, however due to the loose nature of the gravel, the boreholes continued to collapse and fill with gravel. Tri-Tech collected one soil sample, S-2-18, from the center of the containment area. The sample consisted of wet silty clay and gravel.

Laboratory analysis registered DEP at 6 ppm, which is below the most stringent NJDEP SCC. Additional compounds detected consisted of Bbf, Bbk and BaP, which were above the most stringent NJDEP SCC. These compounds however are not associated with DEP or DMP and appear to be related to historical fill material, which is located throughout much of the site. The laboratory analytical results are enclosed in **Appendix B** and the results are summarized in **Table 4**.

Delineation of groundwater and soil contamination in this area is recommended.

4.1.2 AEC 3: Acetone Charcoal Adsorbers

On July 17, 2000, Tri-Tech advanced three soil borings via Geoprobe in the area of the three (3) former acetone charcoal adsorbers at the southeast corner of Building 16. Three soil samples (S-3-1, S-3-2 and S-3-3) were collected from a discrete six-inch interval between 0.83 and 1.66 feet below grade. Groundwater was encountered between 1.66 and 2.66 feet below grade.

Laboratory analysis of the three soil samples registered acetone at 1.6 ppm to 14 ppm, which is below the most stringent NJDEP SCC. Soil sample locations are illustrated in Figure SL-3. The laboratory analytical data is enclosed in **Appendix A** and the results are summarized in **Table 2.**

NO FURTHER ACTION or sampling is proposed for the former acetone charcoal adsorber area.

4.1.3 AEC 7 Former DEP Above Ground Storage Tanks

Five former ASTs containing Diethyl phthalate were located in the courtyard area east of Building No. 16. These tanks were removed from the site at an unknown date. Tri-Tech investigated this area on July 14, 2000 by conducting five soil borings in the reported area of the ASTs. Soil borings were advanced to 6 feet below grade. Soil samples were collected from 1.5 to 2 feet. One groundwater sample (GW-4) was collected from boring S-7-1 through a temporary well point. Groundwater was encountered at a depth of approximately 2 feet below grade.

Laboratory analysis of the five soil samples registered DEP above the most stringent NJDEP SCC of 50 ppm for Impact to Groundwater. Specifically, sample S-7-1 and S-7-2 registered 66 ppm and 86 ppm DEP, respectively. Groundwater sample GW-4 registered 3 ppb of DEP, which is below the NJDEP GQS of 5,000 ppb. The laboratory analytical results for soil are summarized in Table and the groundwater results are summarized in **Table 5.** The laboratory analytical data for the soil and groundwater sample are enclosed in **Appendix B.** The soil sample locations are illustrated in **Figure SL-4.**

In addition to the exceedance of DEP in samples S-7-1 and S-7-2, several PAH compounds, including Benzo (a) anthracene (BaA), Benzo (b) Fluoranthene (BbF), Benzo (k) Fluoranthene (BkF) and Benzo (a) pyrene (BaP) were detected at concentrations above the most stringent NJDEP SCC in samples S-7-1, S-7-4, and sample S-7-5.

Based on the absence of groundwater impact from DEP in the area, additional groundwater sampling is not recommended. Delineation of soil contamination is recommended.

4.1.4 AEC 27:Former 3,000-gallon Horizontal Plasticizer ASTs

On July 17, 2000 and October 5, 2000, Tri-Tech advanced a series of six (6) soil borings in the area of the former horizontal plasticizer ASTs along the east side of Building No. 16. These borings were performed for the purposes of delineating soil sample S-2-3, from the aforementioned and adjacent AEC 2. Soil samples S-2-16 and S-2-17 were located beneath the location of the former horizontal ASTs. Each soil

sample was field screened and a discreet six-inch sample collected at 0 to 6 inches above groundwater, which was encountered between0.5 and 2 feet below grade.

Laboratory analysis of soil samples S-2-12 through S-2-17 registered concentrations of DEP ranging from ND to 6.0 ppm, which is well below the NJDEP SCC of 50 ppm. The soil sample results are summarized in **Table 6** and the laboratory analytical data is enclosed in **Appendix C**. The soil sample locations are illustrated in **Figure SL-5.**

Polyaromatic hydrocarbons (PAHs) detected in samples S-2-15 through S-2-17 exceeded the most stringent NJDEP SCC. These compounds are not associated with DEP and are believed to be related to historic fill, which is throughout much of the property. Issues regarding historic fill are discussed in Section 5.0 of this report.

NO FURTHER ACTION with respect to the former horizontal plasticizer ASTs is recommended.

4.1.5 AEC 10:Former 3,000-gallon UST

On April 11 and 12, 2001, a 3,000-gallon No. 4 heating oil UST was removed from within Building No. 6. This tank was discovered at the end of January 2001, after Winkler vacated the premises. The UST Facility ID number is 0243218. Details regarding the tank registration were provided in the PAR. Six post-excavation soil samples were collected following the removal of the tank on April 12, 2001. Samples were collected from the sidewalls at 0 to 6 inches above groundwater. Laboratory analysis of the six soil samples registered TPHC concentrations of 143 ppm to 9,750 ppm. Two samples PE-04 and PE-06 were further analyzed for PAHs in accordance with NJAC 7:26E. Sample PE-06 registered benzo (a) pyrene (BaP) at 0.83 ppm, which exceeds the NJDEP SCC of 0.66 ppm for Restricted and Unrestricted Use. The laboratory analytical results are summarized in **Table 7**. The soil sample locations are illustrated in **Figure SL-6.**

The details of the tank closure will bee addressed in a SIR which will be submitted to NJDEP BUST under closure number C01-0141. Further investigation of this area will be addressed in the forthcoming Remedial Investigation Report.

4.2 AECs 4, 5 and 6 Electrical Transformers

Three areas of concrete pad-mounted electrical transformers were evaluated through soil sampling. AEC 4 transformers are located on the east side of Building 20-C, within a courtyard area bordered to the east by Building 20-F. AEC 5 transformers are located in the same area as AEC 4 in the northeast corner of the courtyard. AEC 6 transformers are located on the north side of Building 1 within a courtyard area. The laboratory analytical results for all samples collected from AECs 4, 5 and 6 are summarized in **Table 8.**

4.2.1 AEC 4 Electrical Transformers

This pad measures 15 feet long and 9 feet wide and is bordered by Building 20-C to the west. Soil samples were collected from the surface to 6 inches below grade on the north, east and south sides at the concrete pad edge. The three soil samples, S-4-1, S-4-2 and S-4-3, were analyzed for PCBs. The soil sample results are summarized in Table and the soil sample locations are illustrated in **Figure SL-7** and the laboratory analytical results are enclosed in **Appendix B.**

Laboratory analysis registered total PCBs of 0.98 ppm and 0.47 ppm in samples S-4-1 and S-4-2, respectively. Sample S-4-3 registered 15.5 ppm total PCBs and exceeds the NJDEP Unrestricted and Restricted Use SCC of 0.49 ppm and 2 ppm, respectively.

4.2.2 AEC 5 Electrical Transformers

This pad measures 12 feet wide and 22 feet long, and is bordered to the north and east by Building No. 20-F. Two soil samples were collected on the south side of the concrete pad edge at the surface to 6 inches below grade. Both samples were collected on the south side of the concrete pad since the concrete pad surface is pitched to that direction. Soil samples S-5-1 an S-5-2 were located approximately 11.16 feet apart. Soil sample locations are illustrated in **Figure SL-8** and the laboratory analytical results are enclosed in **Appendix B.**

Laboratory analysis registered total PCBs of non-detectable (ND) and 0.12 ppm in samples S-5-1 and S-5-2, respectively. Both samples registered total PCBs below the most stringent NJDEP SCC, the Unrestricted Use criteria of 0.49 ppm. **NO FURTHER SAMPLING/NO FURTHER ACTION** is recommended for this AEC.

4.2.3 AEC 6 Electrical Transformer

This pad measures approximately 11 feet long and 12 feet wide and is bordered to the west by Building No. 1. One soil sample each was collected from the north (S-6-2) and east (S-6-1) edges of the concrete pad. A sample was not collected from the south side edge of the concrete pad since the transformers were active and there was an electrical hazard associated with the south side of the concrete pad.

Laboratory analysis registered total PCBs of 1.2 ppm and 0.91 ppm in samples S-6-1 and S-6-2, respectively. Both samples registered total PCBs above the most stringent NJDEP SCC for Unrestricted Use of 0.49 ppm, but below the Restricted Use SCC of 2 ppm. Soil sample locations are illustrated in **Figure SL-9** and the laboratory analytical results are enclosed in **Appendix B.**

4.3 AEC 9 Alexandria Area

AEC 9 was previously used by the Alexandria Company and was identified as an area of discharge under N.J.A.C. 7:1E. Alexandria operated plastic extruding machines, which used hydraulic oil during operation. The concrete floor in the area was deteriorated in several areas and the floor surface had an oily residue.

On July 13, 2000, Tri-Tech conducted soil sampling in the location of former plastic extruding machines formerly located within the leasehold area of Alexandria. Soil borings were advanced with a direct push/Geoprobe rig operated by Goldstar Environmental Services, Inc. of Phillipsburg, NJ. Laboratory analysis of soil samples collected in this area was conducted for TPHC with contingent PAH analyses based on the reported use of hydraulic oil. TPHC concentrations ranged from ND to 12,600 ppm. PAH analysis was performed on sample S-9-4, S9-6 and S-9-9 as TPHC concentrations in these samples ranged from 220 to 7,490 ppm. Samples S-9-1 and S-9-2 were not further analyzed as these samples represented gross contamination as sample S-9-2 registered TPHC in excess of 10,000 ppm. PAH analyses registered no compounds in excess of the most stringent NJDEP SCC.

A groundwater sample GW-1 was collected from a temporary 1-inch PVC well point. Laboratory analysis was conducted for VOC+10 and BN+15. No individual compounds were detected above the NJDEP GQS for Class IIA aquifers. Total BN tentatively identified compounds (TICs) were detected at 958 ppb, which exceeds the NJDEP GQS of 500 ppb for total non-carcinogenic organic compounds.

The sample locations are illustrated in **Figure SL-10**. The soil sampling results are summarized in **Table 9**. The laboratory analytical results for the soil and groundwater samples are enclosed in **Appendix B.**

4.3.1 AEC 9 Interim Remedial Activities

On October 5 and 6, 2000, Tri-Tech supervised the excavation of approximately 25 cubic yards of petroleum impacted soil/weathered bedrock from the AEC. The excavation measured 15.75 feet long by 9.5 feet wide centered on sample S-9-2. Reddish-brown sedimentary bedrock was encountered at a depth of approximately 3 feet below the concrete floor.

Soil stratigraphy in the excavation consisted of gravelly fill and sand underlying the concrete floor to a depth of approximately one foot. Brownish-gray clayey sand was encountered from one foot to two feet. The soil graded to a reddish brown silty to sandy clay. Weathered sedimentary bedrock was encountered at approximately 3 feet below the concrete floor. Groundwater was encountered above the bedrock.

A petroleum sheen was noted on the bedrock within the excavation. Five post-excavation soil samples were collected from the excavation on October 6, 2000.

Sidewall samples were collected at 6 to 12-inches below the concrete floor within the first soil beneath the concrete floor. One soil sample was collected from decomposed bedrock/sediment within the base of the excavation at 6 to 6.5 feet. Laboratory analysis of the five soil samples registered TPHC concentrations of 4,470 to 13,300 ppm. Three of the five samples registered TPHC in excess of 10,000 ppm. PAH analyses were conducted on three of the five soil samples. PAH concentrations were below the most stringent NJDEP SCC. The soil sampling results are summarized in **Table 10**. The laboratory analytical results are enclosed in **Appendix C.**

4.4 AEC 15 Pits and Sumps

A series of floor drains and sumps are located throughout the building. Due to the topography and location of the building floor slab intruding into the hillside, a series of pumps were set to lower the water table and keep the building floor dry. Water was pumped and discharged as storm water under a NJPDES permit. This permit was terminated on April 12, 2001,pumps were removed and portions of the building flooded.

The path of water was taken from the west portion of the building near Pit D where groundwater seeps up into the building through the floor. Water was then channeled through underground drainpipes and several pits to Pit B located near the Alexandria area. A pump in this pit then pumped the water through a hose across building 1 and out into an open concrete trough through the courtyard area. The trough continued out under the driveway area towards the boiler room. The trough then emptied into an underground pipe, which entered into Pit J6.

Additional storm water was collected in Pit C located in Building 20. This pit collected water through a series of drainpipes beneath the floor. Water from Pit C was pumped through a hose to an underground pipe connected to J6. The third pumping point was located at the loading dock, which without the use of a pump would fill with water infiltrating from beneath the building floor. Water from the loading dock was pumped into the underground pipe connected to J6.

On October 9, 2000, Tri-Tech, supervised Clean Venture, Inc. of Elizabeth, NJ to power wash and evacuate some of the pits in the buildings. During the cleaning of some of the pits, it became apparent that dewatering to completely clean the pits was not possible based on the volume of water flowing into the pits through underground piping. Photographs of these pits are included in **Appendix F.**

A summary of the pit cleaning activities is provided below. Sampling of five pits was conducted on October 9, 2000. Tri-Tech collected samples from five of the pits and each sample was analyzed for TPHC, PPMetals, BN+15, and VOC+10. The sampling results are summarized in **Table 11**. Sample locations are illustrated in **Figure SP-1C.**

4.4.1 Pit J6

This pit was not cleaned on October 9, 2000. Pit J6 is located adjacent to the sanitary sewage lift station to the east of the boiler building. At the time of the SI sampling this pit was receiving surface water/groundwater seepage from the west portion of the building through a series of pumps. Sediment sample (J-6) collected with a decontaminated stainless steel auger registered copper at 706 ppm, which exceeds the NJDEP SCC for Restricted and Unrestricted Use SCC of 600 ppb. The sediment was characterized as a dark silty sludge. After disturbing the sediment in the pit, a petroleum sheen was noted on the water surface. No other compounds were detected in excess of the NJDEP SCC.

4.4.2 Pit J9

Pit J9 is located on the east side of the Site and is the last access point in the Site storm water system prior to discharge into the open water/wetlands further east on the Site. This pit was not cleaned. The sediment in Pit J9 was sampled by advancing a decontaminated stainless steel bucket auger into the sediment and retrieving a sample (J-9).

The sediment was characterized as dark and a petroleum sheen was observed. Laboratory analysis of the sample registered 508 ppm of lead (Pb). Additional PPMetals, BTEX, trichlorofluoromethane and BN compounds registered below the NJDEP Restricted and Unrestricted SCC.

4.4.3 Pit B

Pit B is located to the southwest of the Alexandria Area. This pit had a black oily residue on each side of the pit. Pit B has four pipes entering/exiting into the basin, which is approximately two feet square. The pit was evacuated with a vacuum truck and power washed with all rinsate removed with the vacuum truck. The pit was found to have a bedrock bottom and sidewalls approximately half way down the sides. The concrete above the bedrock had deteriorated and decomposed sedimentary bedrock was washed out from beneath the concrete.

Upon dewatering of the pit, water flow into the pit was observed to occur over the bedrock and through several 4-inch diameter pipes from the west and north area. Due to the hard bottom and lack of sediment after cleaning Pit B, a sample was not collected.

4.4.4 Pit C

Pit C is located in a former production area (more detail keyed to site plan descriptions). Pit C receives storm water/groundwater/surface water from several inlet pipes within the sump. At the time of the sampling a sump pump was moving water from Pit C through pit J6 and eventually to pit J9. Pit C was not cleaned; however a sediment sample was collected with a stainless steel auger. The sediment quality was dark gray stony sludge consistency. Laboratory analysis registered copper and zinc above the NJDEP SCC. In addition, benzo (a) anthracene, chrysene, benzo (b) fluoranthene, benzo (k) fluoranthene, benzo (a) pyrene and indeno (1,2,3-cd) pyrene registered above the NJDEP SCC. TPHCs registered 4,480 ppm.

4.4.5 Pit D

Pit D is located at the northwest corner of the building nearest Schuyler Avenue. Pit D is in an area where groundwater/surface water infiltrates the building through the foundation and floor and runs across the floor. Pit D contained a sump pump, which moved water further east through the Site storm water system. A sediment sample collected in Pit D registered bis(2-Ehtylhexylphthalate), cadmium, chromium, and copper above the NJDEP SCC. TPHCs registered 12,600 ppm.

4.6.6 Pit E

Pit E is located in the near center of the building north of the Alexandria area. The pit appears to accept roof leader water, which was noted to enter the pit and terminate there. The pit had a sandy bottom, however the water was clear and this sump was not cleaned. Laboratory analysis of the sediment sample from Pit E registered copper in excess of the NJDEP SCC.

4.4.7 Pit F

Pit F is located in the northeast corner of the building (Bldg 20-E) in the former optical production area. Upon initial inspection, this sump had an oily scum floating upon the water, which, based on staining noted on the floor, overflowed onto the floor in the past. This sump is down grade of the adjacent Ace auto wrecking yard. Ace is located adjacent to the north property line. Upon partial evacuation with the vacuum truck, a large volume of water was noted to flow back into the pit through seeps on the edges of the concrete sump walls. Upon further dewatering a 16-inch diameter pipe was observed entering the sump from the west and exiting to the east. The pipe was cut through in the sump to allow water to enter the sump and or pipe. The sides and base of the sump had a black oily residue and odor. The pit was power washed and evacuated with the vacuum truck.

4.4.8 Pit G

On May 10, 2001, Tri-Tech collected a sediment/sludge sample from Pit G located to the west of the Alexandria leasehold area. Laboratory analysis of sample S-15-3 registered TPHCs at 59,300 ppm. Diethylphalate (DEP) registered 1,100 ppm, which exceeded the NJDEP SCC for Impact to Groundwater of 50 ppm. Cadmium, copper, lead and zinc were each detected at concentrations exceeding the NJDEP SCC for Restricted Use.

4.4.8 Pit H

Pit H is located located inside the north building wall in Bldg 20-E in the former optical production area. Upon initial inspection, this sump had debris and an oily scum floating upon the water. This sump is also down grade of the adjacent Ace auto wrecking yard and discharges via subsurface piping to Pit F. Debris was removed from this pit and the pit was power washed and evacuated with the vacuum truck. The sediment in Pit H was not sampled.

4.4.9 Open Trough Sampling

On May 10, 2001, Tri-Tech collected three sediment samples within the open trough running between Bldg 1 and the Boiler House (Bldg 3). Sample S-15-1 was collected on the westernmost end of the trough near building 1 and sample S-15-2 was collected on the easternmost portion of the trough just before the trough enters an underground pipe to Pit J6.

Laboratory analysis of the two samples registered detectable concentrations of chlorinated hydrocarbons, BTEX compounds, and various PAHs below the NJDEP SCC. BaP was detected above the Unrestricted Use SCC of 0.66 ppm at 1.9 ppm (S-15-1) and 1.3 ppm (S-15-2). The laboratory analytical results are summarized in **Table 12**. The laboratory analytical results are enclosed in **Appendix E**.

4.5 AEC 16 Floor Trenches

On May 10, 2001, Tri-Tech collected a sample within native soil beneath the accumulated sediment near the wall where the floor trench in Building 20-F appears to exit the building. Laboratory analysis for VOCs, BNAs, PCBs, PP Metals and TPHCs was conducted. The sample was collected by hand augering through the accumulated sediment at the wall to the depth corresponding to the 0 to 6 inch interval below the floor drain invert.

Laboratory analysis registered TPHC at 30,000 ppm. BTEX compounds were detected at concentrations below the most stringent NJDEP SCC. BNA compounds, specifically, BbF and BkB were detected at concentrations exceeding the most stringent NJDEP SCC for unrestricted use. These compounds were detected below the Restricted Use SCC. Copper, lead and zinc were also detected above the NJDEP Restricted and Unrestricted Use SCC. Total PCBs were detected at 3.84 ppm, which exceeds both SCC values. The laboratory analytical results are summarized in **Table 12.** The laboratory analytical results are enclosed in **Appendix E.**

4.6 AEC 18 Ponds/Surface Water Bodies

On May 10, 2001, Tri-Tech collected two sediment samples from the pond, which historically received the outfall discharge from Pit J9. Both samples were analyzed for VOC+10, BN+15, and PPMetals. Sample S-18-1 was located at the J-9 outfall at the west end of the pond. The sediment was characterized as dark and oily. A petroleum sheen was noted on the water surface after the sediment was disturbed. Sample S-18-1 registered VOCs below the NJDEP SCC and NJDEP Sediment Quality Guidance.

Due to dense vegetation along the pond, Tri-Tech was unable locate the outfall of the pond, which is believed to be at the eastern end of the pond. A sediment sample (S-18-2) was collected along the south shore of the pond in the southwest quadrant.

Laboratory analysis indicated that none of the VOC, BNAs or metals detected exceeded the NJDEP SCC for Restricted or Unrestricted Use. TPHC concentrations were 229 ppm in S-18-1 and 79 ppm in S-18-2. However, a number of compounds were detected at concentrations that exceeded the NJDEP Sediment Guidance Evaluation guidelines. These criteria are discussed in Section 5.0, the Baseline Ecological Evaluation. Laboratory analytical results are summarized in **Table 13.** The laborarory analytical results are located in **Appendix E.** Sample locations are illustrated in **Figure SL-11.**

4.7 AEC 21 North Side Of Property

The north side of the property was identified as a potential area of concern due to the scrap metal and auto wrecking facility. There is visible soil erosion from the adjacent property onto the Kleer Kast site. In fact, the adjacent property, which is elevated above the Kleer Kast property, is slowly eroding onto the Kleer Kast property. A large amount of debris, including auto parts, is evident in the eroded soil, obviously migrating with the eroding soil.

On May 10, 2001, Tri-Tech conducted soil sampling along the north property line to document the potential off-site impact from the neighboring auto wrecking and scrap metal facility.

Soil samples were collected with a properly decontaminated stainless steel auger. Soil sample locations are illustrated in **SL-12** and were chosen based upon the topography. Soil samples were collected within the base of the hill above the soil that has eroded down the slope and against the building. A deliberate effort was made to sample the eroding soil from the auto wrecking and scrap metal facility and not the soil native to the sibject site.

Laboratory analysis of the three soil samples S-21-1, S-21-2 and S-21-3 registered detectable concentrations of TPHCs, VOCs, BNAs, PCBs and metals. Detected VOCs did not exceed any of the NJDEP SCC. BNA compounds detected indicated exceedances of the most stringent NJDEP SCC for samples S-21-1 and S-21-2 for several PAH compounds including BaA, BbF, BkF, and BaP. PCBs were detected in S-21-1 and S-21-2 at concentrations of 6.8 ppm and 0.47 ppm, respectively. The concentration detected in S-21-1 exceeds the NJDEP SCC of 2 ppm total PCB for Restricted Use Standards and 0.49 ppm for the most stringent Unrestricted Use Standard.

TPHC concentrations ranged from 192 ppm in sample S-21-3, to 3,080 ppm in sample S-21-2 and 44,300 in sample S-21-1. Copper, lead and zinc were detected in S-21-1 at concentrations of 1,150, 2,450 and 4,420 ppm, respectively. Each compound was detected above the NJDEP SCC for Restricted and Unrestricted Use.

The laboratory analytical results are summarized in **Table 14** and the laboratory analytical data is **Appendix E.**

5.0 BASE LINE ECOLOGICAL EVALUATION

The Baseline Ecological Evaluation (BEE) is a qualitative study based on the results of sample analyses and the impacts observed in either the areas of concern or from the predictions made after consideration of published toxicological studies. The predictions are to be based on similar ecological studies, government documents, articles in peer reviewed scientific literature, and available criteria and guidelines recommended by the NJDEP, NOAA, EPA, or other Federal natural resource agencies.

This BEE has been prepared with respect to potential contaminants of concern detected on the site and specifically within the floor drain system that discharges to the wetlands and surface water at the rear of the facility.

5.1 Contaminants of Potential Ecological Concern (COPEC)

Contaminants of potential ecological concern (COPEC) were detected at the site within the sediment of the drainage system pits and trenches.

- Diethylphalate
- Arsenic
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Zinc
- All Polyaromatic Hydrocarbons in USEPA Method 8270

5.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs), for the purpose of this report are those identified in N.J.A.C. 7:26E-1.8 and outlined in the NJDEP Bureau of Discharge Prevention Environmentally Sensitive Areas Guidance Document (not dated). Specific ESAs for the purpose of this report have been determined to be:

- Surface waters.
- Wetlands and wetland transition areas.

Wetland areas exist within the property boundaries to the east of the site buildings. These wetlands include two surface water bodies to the east of the building and wetland transition areas around these ponds. These surface water bodies drain to the

east into the adjacent Hackensack Meadowlands, on the east side of the former railroad tracks.

5.3 Potential Migration Pathways

The potential migration pathways identified with the drainage swale include:

- Direct contact with sediment
- Ingestion of sediment
- Inhalation of dried sediment
- Food chain exposure
- Sediment transport downstream and along flood plains
- Groundwater transport to surface water

6.0 SITE INVESTIGATION CONCLUSIONS AND RECOMMENDATIONS

During the period of July 17, 2000 through May 10, 2001, Tri-Tech conducted site investigation sampling at several of the identified potential areas of concern. Laboratory analysis of soil and groundwater samples indicated contaminants of concern above the NJDEP SCC for Restricted and Unrestricted Use. Contaminants of concern vary from various metals, chlorinated hydrocarbons, polyaromatic hydrocarbons and phthalate compounds. On the basis of the site investigation work conducted to date, the following conclusions are made:

- Evidence of on-site migration of BTEX compounds, PAHs, PCBs, and metals has been documented. The source of the contamination is from the adjacent and upgradient metal scrap yard and auto wrecking facility. This property is approximately 15 feet higher in elevation. Fires in the scrap yard are common. Soil and sediment erosion from the adjacent property has impacted the physical aspects of the site and transported contaminants onto the site. Visual assessment of Pit F, nearest the northern property line, indicates an oily scum that appears to be migrating downgradient from the scrap yard.

- PAH contaminants in soil appear widespread throughout the site. The source of part of the PAH contaminants are attributed to historic fill material placed on the property prior to development and off-site migration from the adjacent upgradient property. PAH contamination in soil and groundwater associated with the former Alexandria operations area is documented and is attributable to hydraulic oil.

- Diethylphalate (DEP) has been detected in soil and groundwater at former storage location at concentrations exceeding the applicable cleanup criteria.

- Evidence of chromate chemical waste (yellow "blossoms" on the surface and yellowish crystalline powder in the subsurface) was observed on the surface on the eastern portion of the site as well as beneath the asphalt near the loading dock. The chromate waste is part of the well documented Chromate 53 case, which the NJDEP has apparently closed. The chromate chemical waste is not a product of site activities.

- Contaminants of potential ecological concern (COPECs) have been identified at concentrations exceeding the NJDEP Sediment Guidance Evaluation criteria.

Recommendations

- Tri-Tech recommends that delineation of contaminants in both soil and groundwater at each location where the site investigation has indicated such conditions. Portions of this work have been completed and are forthcoming in a separate Remedial Investigation Report.

- Tri-Tech recommends the installation of six groundwater-monitoring wells and a groundwater-sampling program to establish upgrade groundwater quality, and site groundwater quality.

- Tri-Tech recommends that the NJDEP evaluate the previous work performed at the site as part of the Hudson County Chromate project.

Exhibit B

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

August 12, 2008

Mr. Alan Ianuzzi
Tri-Tech Engineering
18 West Blackwell Street
Dover, New Jersey 07801

Via: Picked Up By Recipient

Re: Baseline Ecological Evaluation
450 Schuyler Avenue
Kearny, New Jersey

Dear Alan:

As requested, enclosed please find six bound copies of the final Baseline Ecological Evaluation for the above-referenced site for your use.

Should you have any questions or require additional copies, please do not hesitate to contact me.

Very truly yours,

EcolSciences, Inc.

Chris Koutouzakis
Project Manager

CSK/csk

enclosures

cc: Mr. Mark Miller, PMC, Inc. w/enclosure
Mr. David Moskowitz

75 Fleetwood Drive ☐ Suite 250 ☐ Rockaway, New Jersey 07866 ☐ 973/366-9500 ☐ FAX: 973/366-9593

BASELINE ECOLOGICAL EVALUATION
FOR
450 SCHUYLER AVENUE
BLOCK 226, LOTS 3, 4, & 11
TOWN OF KEARNY
HUDSON COUNTY, NEW JERSEY

Prepared for:
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Submitted to:
State of New Jersey
Department of Environmental Protection
Bureau of Environmental Evaluation and Risk Assessment
401 East State Street, 6th Floor
P.O. Box 413
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973-366-9500

August 2008

TABLE OF CONTENTS

ATTACHMENTS

I. INTRODUCTION AND BACKGROUND

EcolSciences, Inc., was retained by PMC, Inc. to prepare a Baseline Ecological Evaluation (BEE) for submission to the New Jersey Department of Environmental Protection (NJDEP) documenting the investigation of the subject property (the "site"). This BEE was prepared following the guidelines set forth in the New Jersey Department of Environmental Protection *Technical Requirements for Site Remediation* at N.J.A.C. 7:26E-3.11, and is intended to accomplish the following:

- evaluate the nature of the chemical constituents detected on the site;
- identify all constituents of potential ecological concern (COPECs);
- identify environmentally sensitive natural resources within the site boundaries and on properties directly adjacent to the site;
- identify potential COPEC migration pathways to any environmentally sensitive natural resources;
- observe evidence of potential impact to environmentally sensitive natural resources that might be attributed to site contamination; and
- draw conclusions regarding the need to conduct further investigations.

The findings of this BEE are based on an ecological field evaluation conducted by EcolSciences on May 17, 2007 and a review of the following reports:

- Tri-Tech Environmental Engineering, Inc., 2001. Site Investigation Report, 450 Schuyler Avenue, Kearny, New Jersey. September 2001.
- Tri-Tech Environmental Engineering, Inc., 2003. UST Closure Report, 450 Schuyler Avenue, Kearny, New Jersey. February 2003.
- Tri-Tech Environmental Engineering, Inc., 2006. Site Investigation Addendum, 450 Schuyler Avenue, Kearny, New Jersey. January 2006.
- Tri-Tech Environmental Engineering, Inc., 2006. Remedial Investigation Report, 450 Schuyler Avenue, Kearny, New Jersey. January 2006.
- Langan Engineering and Environmental Services, Inc., 1999. Sediment and Water Sampling Report, Kearny Marsh, Kearny, New Jersey. June 22, 1999.

II. SITE DESCRIPTION AND EXISTING CONDITIONS

The following sections describe the environmental setting of the site. This site description includes the ecological and physical features of the site. Figures 1 through 5 are included in Attachment A and depict the USGS Site Location Map, Local Road Map, Habitat and Sample Location Map, Landscape Project Map, and Surface Water Quality Map, respectively.

A. Site Description

The ±19.5-acre site consists of Lots 3, 4, and 11 within Tax Block 226 in the Town of Kearny, Hudson County, New Jersey (Figures 1 and 2). The site is bordered to the north and south by commercial and industrial development, to the west by commercial development and some residential areas, and to the east by an abandoned railway right-of-way (ROW), with Kearny Marsh beyond. The site is characterized as moderately to gently sloping land, at a nominal elevation of approximately 22 feet above Mean Sea Level (msl) in the western portion of the site to approximately 7 feet above Mean Sea Level (msl) in the eastern portion of the site. All structures, which were previously located in the western portion of the site, have been demolished. The eastern portion of the site is characterized as upland successional field, successional woodland, and emergent wetland. Some asphalt-paved areas still exist, and are located in the central and western portions of the site. The wetland area mentioned above, which includes two ponds, exists in the northeastern portion of the site. Pond 1 is the larger of the two ponds and is located in the eastern corner of the site. A smaller ponded area, Pond 2, is located in the east-central portion of the site, closer to the previously developed area. A drainage ditch originates from Pond 1 and flows off-site to the northeast. Although not visible under the water, piped drainage structures likely exist allowing water to drain from the drainage ditch underneath the abandoned railway ROW into Kearny Marsh.

1. On-site Vegetative Communities/Habitats

Based upon species composition, soils, and apparent hydrology noted during the field investigation, five vegetative communities, or habitat areas, were identified within the site: previously developed/disturbed areas, palustrine emergent wetland, palustrine forested wetland, upland successional field, and upland successional woodland/woodland. Each community is briefly described below:

Previously Developed/Disturbed Area – These areas are found in the western portion of the site where structures used to exist. The buildings in these areas have all been demolished, the area is characterized by building foundations/footings, exposed fill, and remaining paved road areas.

Wetlands - This community is comprised of two distinct wetland plant communities; Palustrine emergent (PEM) and Palustrine forested (PFO1) wetlands. The PEM wetland community is located in the eastern central and eastern portions of the site, and includes a large pond (Pond 1), located in the eastern corner of the site, and a smaller ponded area (Pond 2), located in the central eastern portion of the site, closer to the previously developed area. This community is dominated by common reed, with swamp rose mallow as an associate.

The PFO1 wetland community includes a small area of forested wetland located within the emergent wetland area on-site. The canopy of this community is characterized by red maple, silver maple, American elm, and pussy willow. The woody understory is comprised of shrubs and saplings of the canopy species, and the herbaceous community includes common reed.

Upland Successional Woodland/Woodland - This community is located in the northeastern portion of the site, surrounding most of the wetland areas, and is characterized by trees and herbs typical of disturbed sites. The canopy is dominated by cottonwood, with associates of mulberry, black cherry, box elder, and black locust. The shrub/understory layer is dominated by staghorn sumac, and also includes poison ivy. Common herbs include Japanese knotweed, garlic mustard, and common reed.

A small area of more mature woodland exists in the northwest corner of the site between the previously developed area and Schuyler Avenue. The canopy of this community is characterized by black cherry, Norway maple, silver maple, and pin oak. The woody understory is comprised of multiflora rose, Virginia creeper, and poison ivy, and the herbaceous community includes garlic mustard and field garlic.

Upland Successional Field – This community occurs within the south-central and southeastern portions of the site. This community is characterized by herbaceous vegetation typical of disturbed areas, such as mugwort, yellow sweet clover, goldenrod species, common reed, poison ivy, Japanese knotweed, Queen Anne's lace, dogbane, and woolly mullein.

2. Wildlife

During EcolSciences' ecological field evaluation on May 17, 2007, observations of wildlife at the site were recorded. The animal species in the following table were either observed at the site during the evaluation, or are expected to spend time in habitat areas similar to those found at or adjacent to the site. Feeding guild information was obtained from American Wildlife & Plants, A Guide to Wildlife Food Habits (Martin, et al., 1951). Resident/migrant information for birds was obtained from the National Geographic Field Guide to the Birds of North America (Dunn and Alderfer, 2006).

Table: Wildlife Observed or Expected in Habitat Areas On-Site

Mammals			
Common Name	Scientific Name	Feeding Guild	NA
Eastern Gray Squirrel*	*Sciurus carolinensis*	Herbivore	
Meadow Vole	*Microtus pennsylvanicus*	Herbivore/Insectivore	
Muskrat	*Ondatra zibethicus*	Herbivore	
Raccoon	*Procyon lotor*	Omnivore	
Virginia Opossum	*Didelphis virginiana*	Omnivore	
Woodchuck*	*Marmota monax*	Herbivore	

Birds			
Common Name	Scientific Name	Feeding Guild	Resident/Migrant
American Goldfinch*	*Carduelis tristis*	Herbivore (seed eater)	Year round resident
American Robin	*Turdus migratorius*	Herbivore/Insectivore	Migratory
Baltimore Oriole*	*Icterus galbula*	Insectivore/Herbivore	Migratory
Barn Swallow*	*Hirundo rustica*	Insectivore	Migratory
Brown Headed Cowbird*	*Molothrus ater*	Herbivore/Insectivore	Year round resident
Canada Goose*	*Branta canadensis*	Herbivore	Migratory
Canada Warbler*	*Wilsonia canadensis*	Insectivore	Migratory
Carolina Wren*	*Thryothorus ludovicianus*	Insectivore	Year round resident
Common Grackle*	*Quiscalus quiscula*	Herbivore/Insectivore/Carnivore	Year round resident
Common Mallard	*Anas platyrhynchos*	Herbivore	Year round resident
Common Yellowthroat*	*Anas platyrhynchos*	Herbivore	Year round resident
Eastern Kingbird*	*Tyrannus tyrannus*	Insectivore/Herbivore	Migratory
European Starling	*Sturnus vulgaris*	Herbivore/Insectivore	Year round resident
Gray Catbird*	*Dumetella carolinensis*	Herbivore/Insectivore	Migratory
Great Blue Heron*	*Ardea herodias*	Carnivore	Year round resident
House Sparrow*	*Passer domesticus*	Herbivore	Year round resident
Killdeer*	*Charadrius vociferus*	Insectivore	Year round resident
Least Sandpiper*	*Calidris minutilla*	Carnivore (coastal invertebrates)	Migratory
Lesser Yellowlegs*	*Tringa flavipes*	Carnivore (coastal invertebrates)	Migratory
Magnolia Warbler*	*Dendroica magnolia*	Insectivore	Migratory
Red – Winged Blackbird*	*Agelaius phoeniceus*	Herbivore/Insectivore	Year round resident
Rock Dove	*Columba livia*	Herbivore	Year round resident
Song Sparrow*	*Melospiza melodia*	Herbivore/Insectivore	Year round resident
Tree Swallow*	*Tachycineta bicolor*	Insectivore/Herbivore	Migratory
Yellow Warbler*	*Dendroica petechia*	Insectivore	Migratory

Reptiles			
Common Name	Scientific Name	Feeding Guild	NA
Eastern Garter Snake	*Thamnophis striatis*	Carnivore/Piscivore	
Eastern Painted Turtle*	*Chrysemys picta picta*	Carnivore/Omnivore	
Red Eared Slider*	*Trachemys scripta elegans*	Carnivore/Omnivore	

Amphibians			
Common Name	Scientific Name	Feeding Guild	NA
Bull Frog*	*Rana catesbeiana*	Carnivore	
Green Frog	*Rana clamitans*	Insectivore	

Fish			
Common Name	Scientific Name	Feeding Guild	NA
Unknown fish species		Insectivore/Omnivore	

* Species observed during the site evaluation on May 17, 2007.

The wetland, woodland, and field areas on the site could potentially serve as nesting, feeding, and resting locations for both resident and migrating birds. These same areas may also provide suitable habitat for the small mammals listed in the table above. The on-site wetlands could also possibly provide habitat for muskrats and a limited suite of amphibians and reptiles, including species of frogs and turtles.

3. Documented Critical Habitats and Threatened and Endangered Species

Review of the NJDEP Landscape Project (Version 2.1) database indicates that a Rank 1 forest area is located in the eastern portion of the site, and two small Rank 1 forested wetland areas are located in the northeastern corner of the site. A Rank 2 emergent wetland area is located directly adjacent to the site across the railroad tracks to the east (Figure 4). The off-site emergent wetland area is mapped as habitat for the species of concern little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), and glossy ibis (*Plegadis falcinellus*). Species of concern have not been listed by state or federal government agencies as threatened or endangered, but their status is being monitored. These species are not afforded any special regulatory considerations at this time.

The site is mapped within a HUC-14 drainage area which includes unnamed tributaries to the Passaic River within Kearny Marsh and a portion of the Passaic River. The Hackensack River is located approximately 10,900 feet to the east of the site, but outside of the mapped HUC-14. The Hackensack River has been classified by the NJDEP as SE2 C2 (saline/estuarine, category 2) waters at this location (NJDEP, 2008) (Figure 5). The Passaic River is located approximately 6,500 feet to the south. This stretch of the Passaic River and its tributaries have been classified by the NJDEP as SE3 C2 (saline/estuarine, category 2) waters (NJDEP, 2008) (Figure 5). Since the nearby mapped tributaries to the Passaic River within Kearny Marsh are Category 2 waters, the site does not contain any Special Water Resource Protection Area buffers established pursuant to the Stormwater Management regulations (N.J.A.C. 7:8).

B. Environmentally Sensitive Natural Resources

Environmentally sensitive natural resources (ESNRs) are natural features likely to be disproportionately affected by the presence or discharge of hazardous substances. Examples of certain types of ESNRs, defined as environmentally sensitive areas at N.J.A.C. 7:1E-1.8, include, but are not limited to, surface waters; sources of water supply; bay islands and barrier island corridors; beaches; dunes; wetlands and wetland transition areas; breeding areas for forest area nesting species, colonial waterbirds, or aquatic furbearers; migratory stopover areas for migrant shorebirds, raptors, or passerines; wintering areas, including coastal tidal marshes and water areas,

waterfowl concentration areas, and Atlantic white cedar stands; prime fishing areas; finfish migratory pathways; submerged vegetation habitat; shellfish waters; forest areas, including prime forestland and unique forestland; habitat for federal and state endangered or threatened plant and animal species; federal and state wilderness areas; and wild, scenic, recreational, or developed recreational rivers.

Based on existing mapping and field observations during the ecological site inspection, the ESNRs within the site boundaries and on directly adjacent properties are the on-site wetlands in the northeastern portion of the site, the upland successional woodland areas surrounding the on-site wetlands and near Schuyler Avenue, the upland successional field areas located in the central and southeastern portions of the site, and Kearny Marsh, located adjacent to the eastern boundary of the site.

III. SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

The existing environmental conditions at the site and site sampling activities were presented in the investigation reports prepared by Tri-Tech Environmental Engineering. This section contains a summary of the findings of these past environmental investigations on the site as they relate to the on-site and adjacent ESNRs described above. For the purpose of this BEE, any soil samples collected from a depth up to two feet below the ground surface, sediment samples, groundwater samples, and surface water samples were included in this evaluation.

A. Previously Developed-Disturbed Area

The findings of previous environmental investigations conducted by Tri-Tech Engineering indicated the presence of soil contamination in this area of the site above applicable NJDEP cleanup criteria. Soil and groundwater samples were collected in the previously developed-disturbed area (see Figure 3 for approximate sample locations). Soil sampling results from this area contained detections of volatile organic compounds (VOCs), base/neutral compounds (BNAs), total petroleum hydrocarbon compounds (TPHC), metals, and polychlorinated biphenyls (PCBs). Groundwater sampling results from this area contained detections of VOCs and BNAs (see Table 1 in Attachment B for analytical sampling results).

B. On-site Wetlands

The findings of previous environmental investigations conducted by Tri-Tech Engineering indicated the presence of soil, groundwater, surface water, and sediment contamination in this area of the site. Soil, groundwater, surface water, and sediment samples were collected in various locations within the on-site wetland area (see Figure 3 for approximate sample locations). Soil sampling results from this area contained detections of BNAs, TPHC, and metals. Groundwater sampling results from this area contained detections of VOCs. Surface water sampling results from this area contained detections of VOCs, metals, and PCBs. Sediment sampling results from this area contained detections of BNAs, TPHC, metals, and PCBs (see Table 1 in Attachment B for analytical sampling results).

C. Upland Successional Woodland

Two samples were taken in this habitat area (see Figure 3 for approximate sample locations). Sample results contained detections of BNAs, metals, and PCBs (See Table 1 in Attachment B for analytical sampling results).

D. Upland Successional Field

Sixteen soil samples were collected in various locations of the upland successional field area. Sampling locations ranged in depth from 4.5 to 8.0 feet below ground surface. Soil sampling results from this area contained detections of BNAs, TPHC, metals, and PCBs. This soil contamination is attributed to historic fill materials.

E. Adjacent Environmentally Sensitive Natural Resources

Publicly available environmental investigations have reported that the Kearny Marsh system is contaminated with current and historical inputs of landfill leachate, combined sewer outflows, and municipal stormwater discharges. Documented contaminants include cadmium, chromium, copper, manganese, lead, iron, nickel, zinc, PCBs, DDE, DDD, DDT, dieldrin, among other chemical constituents (RERC, 2005).

The previous site investigations by Tri-Tech Engineering described above focused solely on the site. However, Langan Engineering and Environmental Services performed sediment and surface water sampling in the adjacent Kearny Marsh with some sampling locations in close proximity to the site boundary. The three study sampling locations within Kearny Marsh closest to the site boundary were examined for comparison to on-site constituent concentrations. Surface water sampling results from this area contained detections of BNAs and metals. Sediment sampling results from this area contained detections of VOCs, BNAs, TPHC, pesticides, and metals (see report and additional analytical data in Attachment C).

IV. NATURE OF CONSTITUENTS AND CONSTITUENTS OF POTENTIAL ECOLOGICAL CONCERN

This section compares information concerning exposure to chemicals (constituent concentrations in on-site and/or adjacent media and potential contaminant migration pathways) with information regarding ecological effects of chemicals (ecological benchmarks/criteria) in order to properly evaluate the specific circumstances at the site. This comparison was accomplished through the following steps:

1) Identification of any chemical constituents that were detected above laboratory detection limits in on-site and/or adjacent media;

2) Identification of ecological benchmarks/criteria for comparison to the detected constituents;

3) Identification of constituents of potential ecological concern (COPECs). COPECs are defined, for the purposes of this ecological assessment, as those detected constituents whose concentrations in environmental media (maximum or arithmetic mean (mean) concentrations) exceed the applicable ecological benchmarks/criteria;

4) Identification of potential impacts of COPECs to environmentally sensitive areas and/or ecological receptors; and

5) Identification of remedial actions proposed for the site that may affect potential impacts to ecological receptors.

A. Detected Constituents

For the purpose of this BEE, soil samples, groundwater samples, surface water samples, and sediment samples were included in this evaluation. The analytical results of these sampling activities are summarized above in Section III and discussed in detail in the environmental investigation reports prepared by Tri-Tech Engineering and Langan Engineering and Environmental Services.

1. Soils

For the purpose of this BEE, any soil samples collected from a depth up to two feet below the ground surface were included in this evaluation. A listing of the constituents detected in on-site soils above laboratory minimum detection limits is given below (see Table 1):

- **Metals** - antimony, arsenic, beryllium, cadmium, total chromium, hexavalent chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

- **BNAs** – acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, dibenz(a,h)anthracene, diethylphthalate, dimethylphthalate, 2,6-dinitrotoluene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene.

- **TPHCs**

- **PCBs** - Aroclor-1254 and Total PCBs.

- **VOCs** – acetone, benzene, 2-butanone, chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene, ethylbenzene, styrene, tetrachloroethene, trichlorfluoromethane, trichloroethene, toluene, and xylene.

2. Groundwater

A listing of the constituents detected in on-site groundwater above laboratory minimum detection limits is given below (see Table 1):

- **BNAs** - anthracene, bis(2-ethylhexyl)phthalate, and diethylphthalate.

- **VOCs** – acetone, carbon disulfide, chloroform, 1,1-dichloroethane, cis-1,2-dichloroethene, ethylbenzene, tetrachloroethene, trichloroethene, toluene, vinyl chloride, and xylene.

3. Surface Water

Surface water was sampled from three locations in Pond 1. A listing of the constituents detected in on-site surface water above laboratory minimum detection limits is given below (see Table 1):

- **VOCs** - chloroform, tetrachloroethene, and trichloroethene.

- **Metals** - chromium, copper, lead, nickel, silver, and zinc.

4. Sediments

Sediments were sampled from five locations in Pond 1 and three locations in Pond 2. A listing of the constituents detected in on-site sediments above laboratory minimum detection limits is given below (see Table 1):

- **Metals** - arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, and zinc.

- **BNAs** - acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, diethylphthalate, di-n-butylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene.

- **TPHCs**

- **PCBs** - Aroclor-1254, Aroclor-1260, and Total PCBs.

B. Identification of Benchmarks/Criteria

Constituents detected above laboratory detection limits were compared to ecological screening criteria. Several reference sources were searched in order to identify the benchmarks/criteria that would be most appropriate, in the context of a BEE, for comparison to the concentrations of detected constituents in on-site environmental media.

For constituents detected in surficial soils, ecological benchmarks were referenced from Oak Ridge National Laboratory's *Preliminary Remediation Goals for Ecological Endpoints* (ORNL, 1997). USEPA Region V Ecological Screening Levels (ESLs) for soil were used for comparison to constituent concentrations when ORNL, 1997 benchmarks were unavailable for specific constituents (USEPA Region II does not have any published ESLs). These ecological screening criteria are presented in Table 2 (Attachment B), along with maximum and mean constituent concentrations.

For constituents detected in surface water, ecological benchmarks are values found as either freshwater chronic aquatic life criteria taken from the NJDEP's *Surface Water Quality Standards* (NJDEP, 2006), Criterion Continuous Concentrations (CCCs) (freshwater chronic screening benchmarks) taken from the United States Environmental Protection Agency (USEPA), Office of Water and Office of Science and Technology's *National Recommended Water Quality Criteria* (USEPA, 2006), secondary chronic aquatic life values taken from Oak Ridge National Laboratory's *Preliminary Remediation Goals for Ecological Endpoints* (ORNL, 1997), or as USEPA Region V ESLs for water. Since ecological exposures to detected constituents in groundwater usually result from seepage to surface water areas, the surface water criteria described above were also used for comparison to groundwater constituent concentrations.

For constituents detected in sediments, ecological benchmarks are found as either lowest effects levels (LELs) taken from the Ontario Ministry of the Environment's *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario* (Persaud, et al., 1993), effects range – low (ER-L) values taken from *Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments* (Long, et al, 1995), or sediment values taken from Oak Ridge National Laboratory's *Preliminary Remediation Goals for Ecological Endpoints* (ORNL, 1997).

C. Identification of Constituents of Potential Ecological Concern

Constituents of potential ecological concern (COPECs) are defined, for the purposes of this screening-level assessment, as those constituents whose concentrations in environmental media exceed the applicable screening-level benchmarks/criteria. Maximum and mean constituent concentrations from each ESNR (and other habitat areas, depending on contaminant migration potential) were compared to the applicable ecological screening benchmarks in order to determine exceedances. COPECs that are determined in this way are assuming that the maximum or mean constituent concentration in on-site media is the estimated dose to the ecological receptor. Determining or modeling actual doses to ecological receptors is out of the scope of this screening level assessment. Therefore, since COPEC determination does not utilize an actual dose to a receptor, COPECs determined using this method might not necessarily pose any appreciable ecological risk.

Table 2 (Attachment B) presents the chemical constituents detected above laboratory detection limits from each ESNR (and other habitat areas, depending on contaminant migration potential), and compares them to ecological screening criteria. Additionally, Table 3 (Attachment B) presents the chemical constituents detected at sampling locations in the adjacent Kearny Marsh (as reported in the Langan Engineering Sediment and Water Sampling Report), and compares them to ecological screening criteria.

1. **Soils**

The majority of the on-site soil sampling locations are within the "Previously Developed – Disturbed" habitat area on-site, which is not considered an ESNR. The analytical data from soils in this habitat area will not be compared to ecological screening benchmarks because the area is not considered an ESNR, the soils in the area will be remediated either by excavation or capping during re-development, and because sample locations exist in on-site ESNRs that account for any potential contaminant migration from the "Previously Developed – Disturbed" habitat area to on-site and directly adjacent ESNRs.

Some soil sampling also took place in the "Upland Successional Field" habitat area on-site. The analytical data from soils in this habitat area will also not be compared to ecological screening benchmarks because the soils in the area will be remediated by capping during re-development, and because sample locations exist in on-site ESNRs that account for any potential contaminant migration from the "Upland Successional Field" habitat area to on-site and directly adjacent ESNRs. Therefore, the constituents listed below in this section are from soils in the "Upland Successional Woodland" habitat area only.

Detected chemical constituents in soils that exceed their ecological screening criteria, and thus could potentially be considered COPECs, are listed below, and can also be viewed in Table 2 (Attachment B).

- **Metals** - total chromium, hexavalent chromium, copper, lead, mercury, selenium, thallium, and zinc.
- **BNAs** – bis(2-ethylhexyl)phthalate, butylbenzylphthalate, dibenz(a,h)anthracene, and 2,6-dinitrotoluene.
- **PCBs** - Total PCBs.

The results described above for soils in the "Upland Successional Woodland" area came from two sample locations that are located on the boundary of the "Previously Developed/Disturbed" area, and will most likely be capped during future re-development (see Section F., "Remedial Actions" below). Therefore, the constituents in these soils should not be considered COPECs for this area of concern.

2. Groundwater

Detected chemical constituents in groundwater that exceed their ecological screening criteria, and thus could potentially be considered COPECs, are listed below, and can also be viewed in Table 2 (Attachment B).

- **BNAs** - anthracene, bis(2-ethylhexyl)phthalate, and diethylphthalate.
- **VOCs** – carbon disulfide, toluene, and xylene.

Only the arithmetic mean of the concentrations of anthracene in groundwater exceeded the applicable ecological screening criteria. In this type of ecological evaluation, when calculating mean concentrations for samples within an area of concern, ½ of the method detection limit is

typically used for non-detect samples. Due to differing dilution levels needed during laboratory analysis, higher method detection limits were used for some non-detect samples. The subsequent use of these higher method detection limits when calculating the mean yielded an artificially inflated mean concentration. Because this artificially inflated mean concentration exceeded the screening criteria, while the maximum detected concentration did not, this constituent should not be considered a COPEC for this area of concern. This leaves carbon disulfide, toluene, xylene, bis(2-ethylhexyl)phthalate, and diethylphthalate as COPECs for this area of concern.

3. Surface Water

Detected chemical constituents in on-site surface water sampled in Pond 1 that exceed their ecological screening criteria, and thus could potentially be considered COPECs, are listed below, and can also be viewed in Table 2 (Attachment B).

- **Metals** - copper, lead, and silver.

The listed COPEC metals exceed their respective ecological screening criteria by less than an order of magnitude, and therefore do not pose a significant risk to ecological receptors, and should not be considered COPECs for this area of concern. Additionally, a decreasing concentration gradient along the downstream flow pathway is evident in copper and lead concentrations indicating that these constituents are not migrating off-site at concentrations that may pose a risk to ecological receptors in the adjacent Kearny Marsh.

The Langan Engineering sediment and water sampling report contains data for lead and silver in adjacent Kearny Marsh. At the three sampling locations closest to the site boundary (W7, W8, and W9), silver was not detected, and copper was not sampled (Attachment C). Off-site lead concentrations are slightly lower than concentrations observed on-site (11.6 ug/l maximum in Kearny Marsh vs. a 19.8 ug/l maximum on-site), and also only exceed their respective ecological screening criteria by less than an order of magnitude (Tables 2 and 3 in Attachment B).

4. Sediments

Detected chemical constituents in sediments that exceed their ecological screening criteria, and thus could potentially be considered COPECs, are listed below, and can also be viewed in Table 2 (Attachment B).

- **Metals** - arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

- **BNAs** – acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, diethylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene.

- **PCBs** - Aroclor-1254, Aroclor-1260, and Total PCBs.

The following chemical constituents detected in Pond 1 sediments exceed their respective ecological screening criteria by less than an order of magnitude, and therefore do not pose a significant risk to ecological receptors, and should not be considered COPECs for this area of concern: acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, diethylphthalate, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, arsenic, cadmium, chromium, mercury, nickel, and zinc. This leaves copper, lead, Arochlor-1254, Arochlor-1260, and total PCBs as COPECs for sediments in Pond 1.

The following chemical constituents detected in Pond 2 sediments exceed their respective ecological screening criteria by less than an order of magnitude, and therefore do not pose a significant risk to ecological receptors, and should not be considered COPECs for this area of concern:benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, arsenic, chromium, and silver. This leaves bis(2-ethylhexyl)phthalate, diethylphthalate, cadmium, copper, lead, mercury, nickel, zinc Arochlor-1254, Arochlor-1260, and total PCBs as COPECs for sediments in Pond 2.

D. Potential Chemical Constituent Migration Pathways

ESNRs are natural features likely to be disproportionately affected by the presence or discharge of hazardous substances. The ESNRs associated with the site and surrounding areas are described in Section II. B of this report, and include the on-site wetlands in the northeastern portion of the site, the upland successional woodland areas surrounding the on-site wetlands and near Schuyler Avenue, the upland successional field areas located in the central and southeastern portions of the site, and Kearny Marsh, located adjacent to the eastern boundary of the site. Under existing conditions, on-site ESNRs are currently impacted by COPECs. COPECs in on-site environmental media include carbon disulfide, toluene, xylene, bis(2-ethylhexyl)phthalate, and diethylphthalate in on-site groundwater; copper, lead, Arochlor-1254, Arochlor-1260, and total PCBs in Pond 1 sediments; and bis(2-ethylhexyl)phthalate, diethylphthalate, cadmium, copper, lead, mercury, nickel, zinc Arochlor-1254, Arochlor-1260, and total PCBs in Pond 2 sediments.

These constituents could potentially be transported to other on-site ESNRs or directly adjacent off-site ESNRs. Chemical compounds can migrate by several pathways, including:

- physical transport of particulate matter, including soils and other small particles, via overland erosion, runoff, and surface water conveyance (high tides and/or flood events);
- physical transport of fine soil particles into wind-borne dust that could be transported via air currents; and
- physical transport of dissolved ions or polar organic (i.e., water-soluble) molecules by surface water (including permanent water features and runoff) or groundwater movements;

Based on the topography and historic drainage direction at the site, the chemical constituents in environmental media within the "Previously Developed – Disturbed Area", may have migrated into on-site ESNRs such as wetland surface waters and sediments. Subsequently, these same constituents in wetland surface waters and sediments may have potentially migrated into surface waters and sediments of the adjacent Kearny Marsh ESNR.

As mentioned previously, the Kearny Marsh system is contaminated with current and historical inputs of landfill leachate (from Keegan Landfill; a CERCLA and NJDEP known contaminated site), combined sewer outflows, and municipal stormwater discharges (RERC, 2005). Additionally, Kearny Scrap Metal Company is an NJDEP known contaminated site, and is located directly adjacent to the site along the northern boundary. This area contains a large scrap yard of old deteriorating automobiles and other forms of metal. Runoff from this scrap yard drains southward and eastward into the drainage ditch that originates in on-site Pond 1 and flows off-site, eventually draining into Kearny Marsh.

1. Soils

Additional constituent migration from on-site soils in the "Previously Developed – Disturbed Area" is not likely to occur, as silt fencing has been placed along the boundaries of this area during remedial activities. Erosion from the woodland or upland successional field areas onsite is not likely to occur in significant amounts, as these areas are heavily vegetated. The heavy vegetative cover over the woodland and upland successional field areas of the property would also minimize aerial transport of particulates.

2. Groundwater

There is currently no data regarding the potential migration of the VOC constituents detected in on-site groundwater into on-site surface waters and/or sediments. There is also no data regarding the potential migration of the two BNA COPECs detected in on-site groundwater (bis(2-ethylhexyl)phthalate and diethylphthalate) into on-site surface waters, but the two remaining BNA compounds are both found at levels exceeding their respective ecological screening criteria in on-site sediments.

However, movement of large non-polar compounds like bis(2-ethylhexyl)phthalate, through soil solution is extremely slow, indicating little potential for groundwater transport (ATSDR, 2002). Therefore, groundwater is most likely not the mode of constituent migration of this particular BNA compound.

3. Surface Water

As mentioned previously, a decreasing concentration gradient along the downstream flow pathway is evident in on-site surface water copper and lead concentrations indicating that these constituents are not migrating off-site at concentrations that may pose a risk to ecological receptors in the adjacent Kearny Marsh.

4. Sediment

Mean concentrations of the following COPECs observed in on-site sediments of Pond 1 were below the respective mean concentrations reported for adjacent Kearny Marsh: BNAs: benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene; and Metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc.

E. Visual Observations of Potential Impact

The following are visual observations made in the field concerning the possible impact of contamination on ecological resources:

- Stressed or Dead Vegetation - The vegetation observed on-site appeared to be in healthy, vigorous condition, with no apparent areas of stressed or dead vegetation. Since PCBs are listed as COPECs, special attention was given to possible observations of chlorosis in leafy green vegetation. No chlorosis was observed.

- Discolored Soil, Sediment, or Water – Site remediation in the form of building demolition and removal of rubble was being conducted at the time of the site inspection, therefore, the soils/rubble in the "Previously Developed – Disturbed Area" was not assessed for visual impacts. No discolored soil, sediment, or water was observed in all other site areas during the site assessment, and no sheens were observed in the on-site surface waters.

- Absence of Anticipated Biota - The vegetative and animal species observed by presence or sign were more diverse than the assemblage anticipated for an industrial property in a highly developed area because of the amount of suitable undeveloped habitat on-site, and the site's proximity to a large open habitat area such as Kearny Marsh. No species or communities were conspicuous by their absence.

- Seeps or Discharges - No visible seeps or discharges were observed on the site.

F. Remedial Actions

Remedial action is ongoing for on-site soils and is currently proposed for groundwater; however, no remedial actions are currently proposed for on-site sediments and surface water. Proposed remedial activities for on-site contaminated soils include the removal and off-site disposal of all heavily contaminated soils where product is observed, and appropriate capping of additional contaminated soil areas during future re-development. Thus far, no specific re-development plan has been proposed for the site, however, commercial/industrial re-development is planned for the "Previously Developed – Disturbed" area and the "Upland Successional Field" area. Capping of contaminated on-site soils during re-development would provide a physical barrier, including impervious surfaces (such as building areas, driveways, and sidewalks), which will significantly reduce or eliminate potential ecological exposure to any remaining soil contamination. Additionally, capping will also reduce or eliminate contaminant migration potential.

V. CONCLUSIONS AND RECOMMENDATIONS

EcolSciences, Inc., performed this BEE in conformance with the guidelines set forth in the New Jersey Department of Environmental Protection *Technical Requirements for Site Remediation* at N.J.A.C. 7:26E-3.11 for the property referenced as Lots 3, 4, 8A, 8B, and 11 within Tax Block 226 in the Town of Kearny, Hudson County, New Jersey. The conclusions and recommendations of the BEE are summarized below.

A. Conclusions

- The wetland area in the northeastern portion of the site is mapped as colonial waterbird foraging habitat, and the adjacent wetland area is a Natural Heritage Priority Site known as Kearny Marsh, and the latter is documented habitat for the State-endangered pied-billed grebe and also listed as colonial waterbird foraging habitat.

- ESNRs within the site boundaries and on adjacent properties are the on-site wetlands in the northeastern portion of the site, the upland successional woodland areas surrounding the on-site wetlands and near Schuyler Avenue, the upland successional field areas located in the central and southeastern portions of the site, and Kearny Marsh, located adjacent to the eastern boundary of the site.

- Chemical constituents detected in on-site soils include BNAs, TPHCs, metals, VOCs, and PCBs.

- Chemical constituents detected in on-site groundwater include BNAs and VOCs.

- Chemical constituents detected in on-site surface water include VOCs and metals.

- Chemical constituents detected in on-site sediments include BNAs, TPHCs, metals, and PCBs.

- Several metals, BNAs, and total PCBs were present in on-site "Upland Successional Woodland" area soils at concentrations exceeding their respective ecological screening criteria. However, the two sample locations are on the boundary of the "Previously Developed/Disturbed" area, and will most likely be capped during future re-development. Because no migration pathways will exist for the detected constituents in this area, the constituents exceeding ecological screening benchmarks in these soils should not be considered COPECs.

- The BNAs anthracene, bis(2-ethylhexyl)phthalate, diethylphthalate, and the volatile organic compounds carbon disulfide, toluene, and xylene were present in on-site groundwater at concentrations exceeding their respective ecological screening criteria. After further evaluation, carbon disulfide, toluene, xylene, bis(2-ethylhexyl)phthalate, and diethylphthalate should be considered COPECs for this area of concern.

- The metals copper, lead, and silver were present in on-site surface water at concentrations exceeding their respective ecological screening criteria. After further evaluation of the degrees of exceedances and the presence of a decreasing concentration gradient, these metals should not be considered COPECs for this area of concern.

- Several metals, BNAs, and PCBs (Aroclor-1254, Aroclor-1260, and total PCBs) were present in on-site sediments of Ponds 1 and 2 at concentrations exceeding their respective ecological screening criteria. After further evaluation of the degrees of exceedances, the following constituents should be considered COPECs for these areas of concern: copper, lead, Arochlor-1254, Arochlor-1260, and total PCBs as COPECs in Pond 1, and bis(2-ethylhexyl)phthalate, diethylphthalate, cadmium, copper, lead, mercury, nickel, zinc Arochlor-1254, Arochlor-1260, and total PCBs in Pond 2.

- No visual observations of potential ecological impacts were made during the site inspection.

- Publicly available environmental investigations have reported that the Kearny Marsh system is contaminated with current and historical inputs of landfill leachate, combined sewer outflows, and municipal stormwater discharges. Documented contaminants include cadmium, chromium, copper, manganese, lead, iron, nickel, zinc, PCBs, DDE, DDD, DDT, dieldrin, among other chemical constituents.

- Mean concentrations of the following COPECs observed in on-site sediments of Pond 1 were below the respective mean concentrations reported for sediments in adjacent Kearny Marsh: BNAs: benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. Metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc. PCBs: Total PCBs. The remaining BNA compounds (acenaphthene, acenaphthylene, diethylphthalate, and fluorene) and two specific PCB congeners (Aroclor-1254 and Aroclor-1260) were not sampled for in Kearny Marsh in the particular study used for comparison.

B. Recommendations for Continued Ecological Investigations

Based on the history of discharges to the Kearny Marsh system, the presence of Keegan Landfill in the marsh, and reported contaminant concentrations from sediment sampling locations in Kearny Marsh adjacent to the site, it is apparent that the site is not a significant contributor of contamination to Kearny Marsh, as mean concentrations most of the BNA constituent COPECs (except for acenaphthene, acenaphthylene, diethylphthalate, and fluorene) and all metal constituent COPECs observed in on-site sediments of Pond 1 were below the respective mean concentrations reported for adjacent Kearny Marsh.

Remediation of the on-site wetland sediments through delineation and excavation of impacted areas would likely cause significant adverse impacts to the community structure of the existing emergent wetland area. In addition, the disturbances caused by excavation of impacted wetland sediments may mobilize contaminants currently adsorbed to particulate matter, thus increasing the potential for the migration of on-site contamination. Based on the level of contamination observed, disturbances from remediation would not be warranted.

Based on the nature and concentrations of the onsite COPECs, the current remediation of contaminated on-site soils, proposed groundwater remediation, the protective nature of the proposed site improvements on the property's upland areas, and the significant adverse impacts that would result from attempts to delineate and remove or remediate impacted sediments from the wetland areas, EcolSciences recommends no further ecological investigations, and requests that the NJDEP approve this request.

VI. REFERENCES

Agency for Toxic Substances and Disease Registry, 2002. Toxicological Profiles. U.S. Department of Health and Human Services, Atlanta, Georgia.

Dunn, J.L. and Alderfer, J., 2006. *National Geographic Field Guide to the Birds of North America, Fifth Edition*. National Geographic Society, Washington D.C.

Langan Engineering and Environmental Services, Inc., 1999. Sediment and Water Sampling Report, Kearny Marsh, Kearny, New Jersey. June 22, 1999.

Long, E.R., MacDonald, D.D., Smith, S.L., and Calder, F.D., 1995. *Incidence of Adverse Biological Effects Within Ranges of Chemical Concentrations in Marine and Estuarine Sediments*. Environmental Management Vol. 19, No. 1. pp. 81-97.

Martin, A.C., Zim, H.S., and Nelson, A.L., 1951. American Wildlife & Plants, A Guide to Wildlife Food Habits. Dover Publications, Inc., New York, NY.

New Jersey Department of Environmental Protection (NJDEP), 1993. *"A Summary of Selected Soil Constituents and Contaminants at Background Locations in New Jersey"*. NJDEP, Site Remediation Program and Division of Science and Research, September 1993.

NJDEP, 2002, as amended February 2003, Technical Requirements for Site Remediation. N.J.A.C. 7:26E.

NJDEP, 2008. Surface Water Quality Standards. N.J.A.C. 7:9B-1.15.

Oak Ridge National Laboratory (ORNL). 1997. Preliminary Remediation Goals for Soil Remediation, August 1997.

Persaud, D., Jaagumagi, R., and Hayton, A., 1993. *Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario*. ISBN 0-7729-9248-7. Ontario Ministry of the Environment, Ottawa, Ontario.

Rutgers Environmental Research Clinic (RERC), 2005. *Kearny Marsh Restoration Project Preliminary Report*. November 23, 2005.

Tri-Tech Environmental Engineering, Inc., 2001. Site Investigation Report, 450 Schuyler Avenue, Kearny, New Jersey. September 2001.

Tri-Tech Environmental Engineering, Inc., 2003. UST Closure Report, 450 Schuyler Avenue, Kearny, New Jersey. February 2003.

REFERENCES (continued)

Tri-Tech Environmental Engineering, Inc., 2006. Site Investigation Addendum, 450 Schuyler Avenue, Kearny, New Jersey. January 2006.

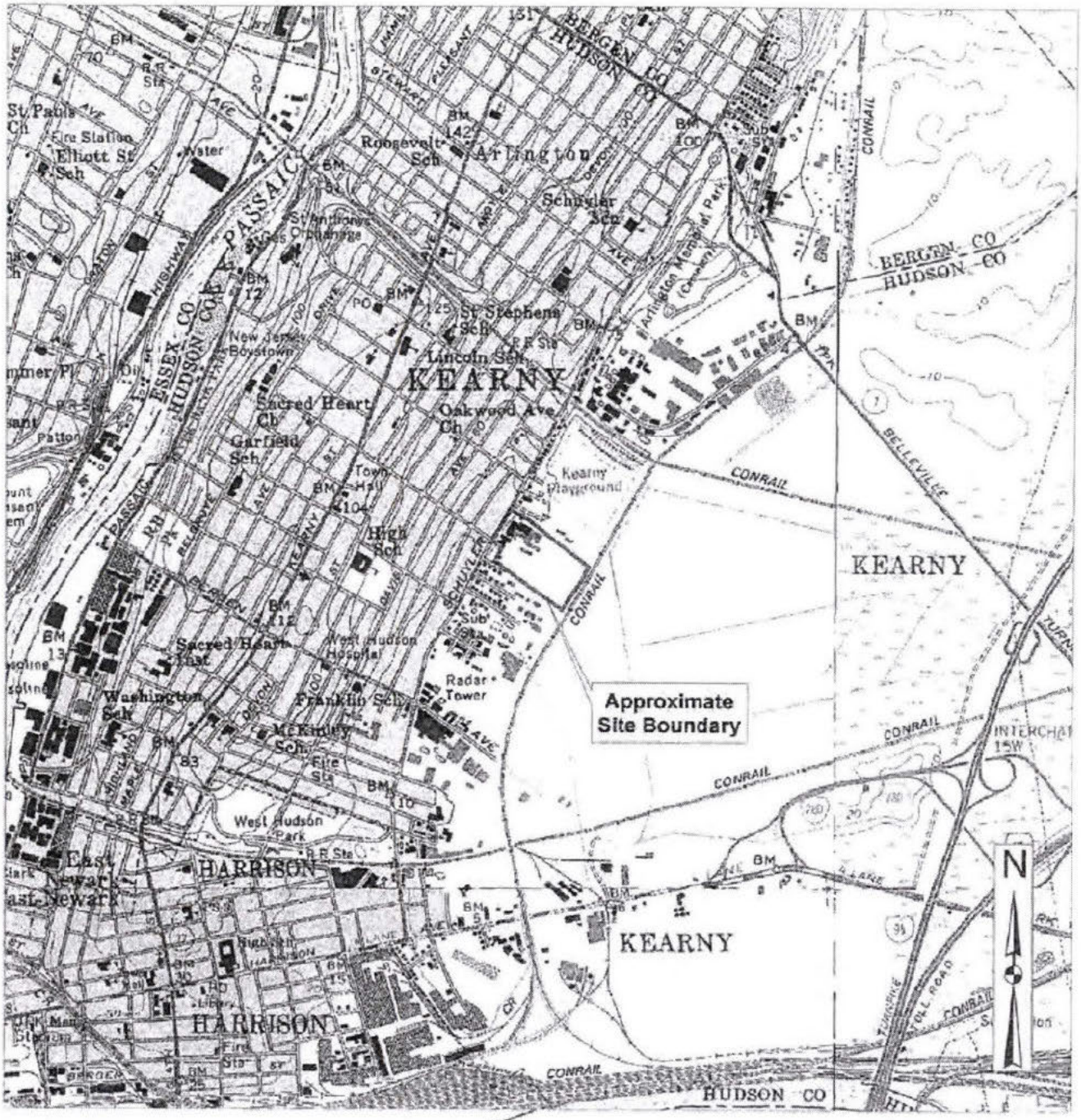
Tri-Tech Environmental Engineering, Inc., 2006. Remedial Investigation Report, 450 Schuyler Avenue, Kearny, New Jersey. January 2006.

USEPA Region 5, RCRA, Ecological Screening Levels (ESLs), August 22, 2003.

USEPA, Office of Water and Office of Science and Technology, 2006. *National Recommended Water Quality Criteria.*

ATTACHMENT A

Figures



State Plane Coordinates (New Jersey NAD 83)
592,195' E, 702,755' N

FIGURE 1: USGS SITE LOCATION

450 Schuyler Avenue
Block 226, Lots 3, 4, & 11
Town of Kearny
Hudson County, New Jersey

Source: USDA, NRCS. 2001. Digital Raster Graph of Hudson County, New Jersey (Orange, NJ Quadrangle)

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 5/16/07

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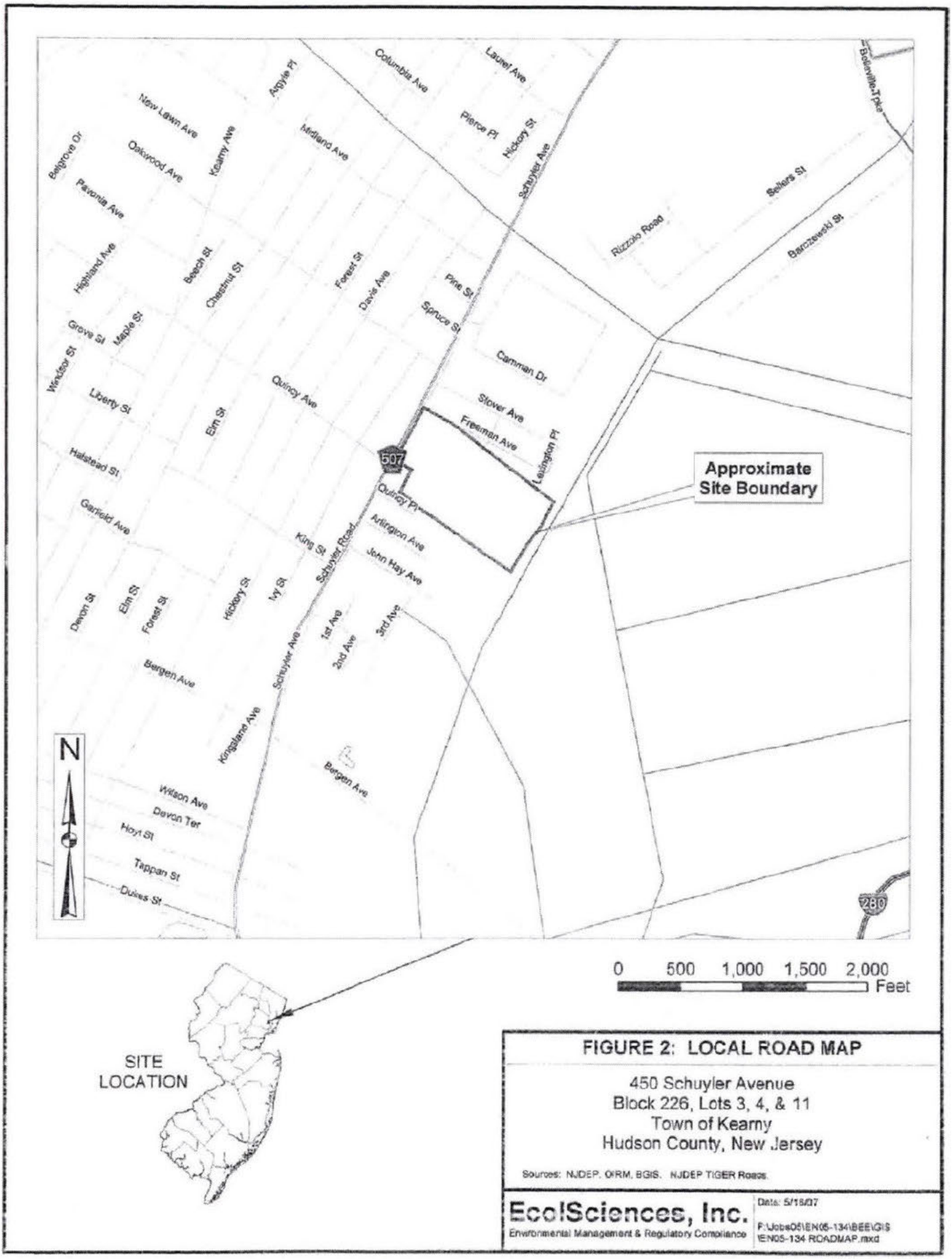

FIGURE 2: LOCAL ROAD MAP

450 Schuyler Avenue
Block 226, Lots 3, 4, & 11
Town of Kearny
Hudson County, New Jersey

Sources: NJDEP, OIRM, BGIS. NJDEP TIGER Roads.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 5/15/07

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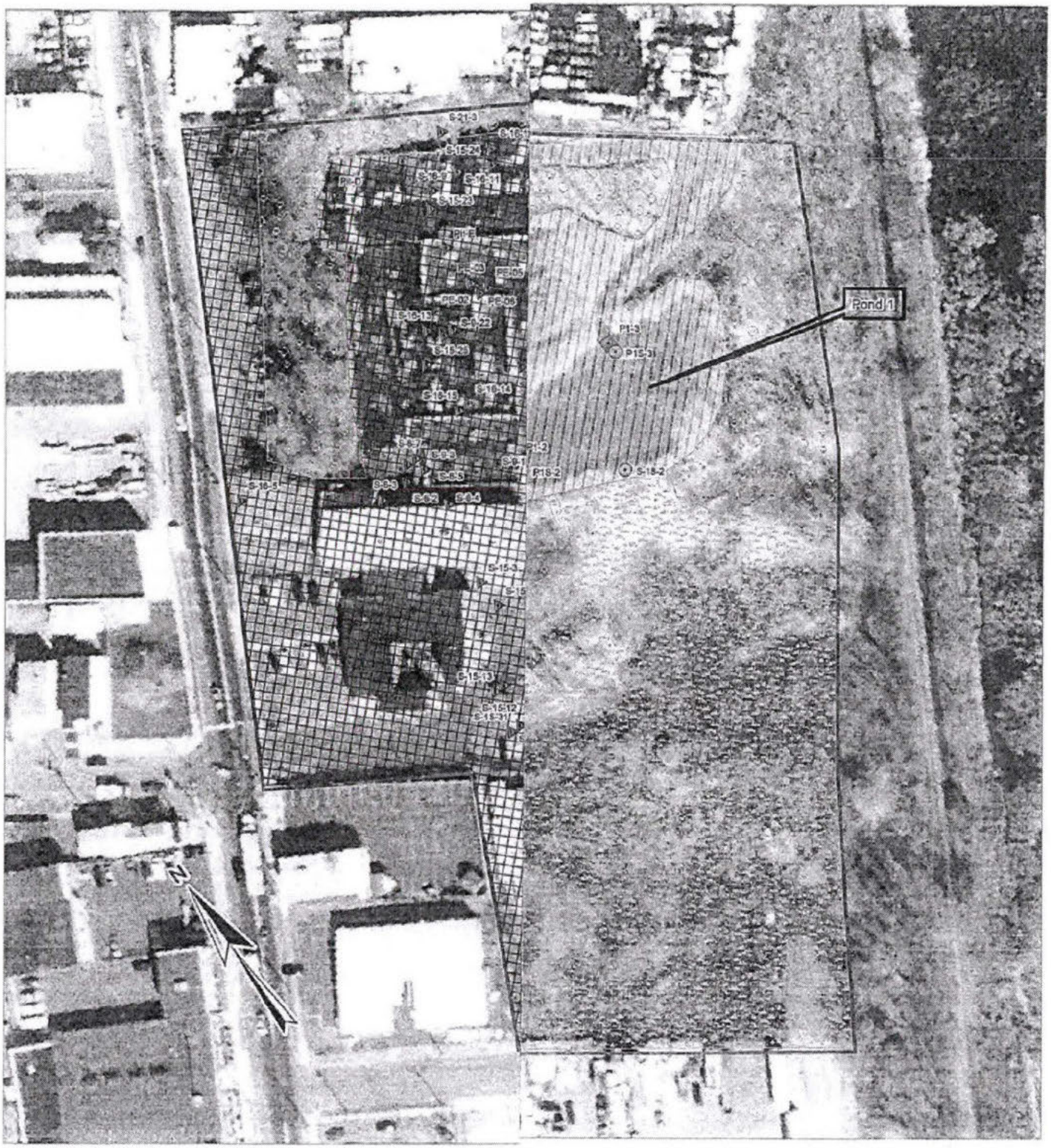

Legend

- Approximate Site Boundary
- Upland Successional Woodland - Woodland
- Wetlands
- Upland Successional Field
- Previously Developed-Disturbed Area
- Approximate Soil Sampling Locations
- Approximate Surface Water Sampling Locations
- Approximate Sediment Sampling Locations
- Approximate Groundwater Sampling Locations

FIGURE 3: HABITAT & SAMPLING LOCATION MAP

450 Schuyler Avenue
Block 226, Lots 3, 4, & 11
Town of Kearny
Hudson County, New Jersey

Sources:
State of NJ, OIT. 2003. NJ 2002 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 7/11/07

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Approximate site boundary

Critical Habitat

Emergent Wetlands	Forest
RANK	RANK
1 - Suitable habitat	1 - Suitable habitat
2 - Special concern	2 - Special concern
3 - State threatened	3 - State threatened
4 - State endangered	4 - State endangered
5 - Federal T and E	5 - Federal T and E
Forested Wetlands	**Grassland**
RANK	RANK
1 - Suitable habitat	1 - Suitable habitat
2 - Special concern	2 - Special concern
3 - State threatened	3 - State threatened
4 - State endangered	4 - State endangered
5 - Federal T and E	5 - Federal T and E

0 1,000 2,000 3,000 4,000 Feet

FIGURE 4: LANDSCAPE PROJECT

450 Schuyler Avenue
Block 226, Lots 3, 4, & 11
Town of Kearny
Hudson County, New Jersey

Sources:
NJDEP, DFW, ENSP. 2008. New Jersey's Landscape Project (Version 2.1).
State of NJ, OIT. 2003. NJ 2002 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 7/15/08

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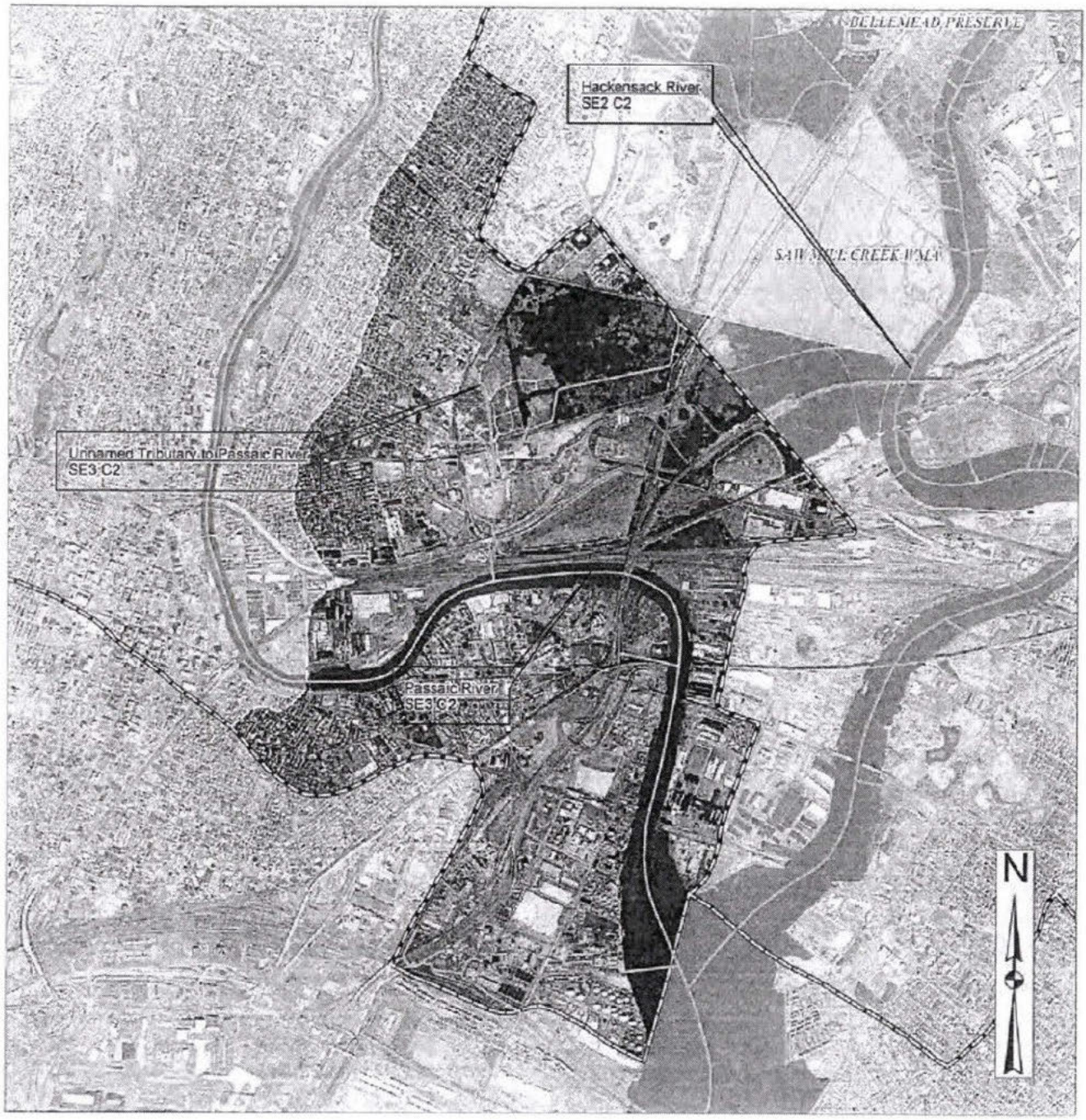

Surface Water Quality

Antidegradation designation

- C1 - Category 1 Water
- C2 - Category 2 Water
- ON - Outstanding National Resource
- DR - Delaware River
- Approximate Site Boundary
- Watershed Management Area Boundary
- HUC 14 Boundary
- State Open Space (2005)
- Federal Open Space (1999)

FIGURE 5: SURFACE WATER QUALITY

450 Schuyler Avenue
Block 226, Lots 3, 4, & 11
Town of Kearny
Hudson County, New Jersey

Sources:
NJDEP, WMS, BFBM, 2007. NJDEP Surface Water Quality Standards of New Jersey (Edition 200606 DRAFT).
State of NJ, OIT, 2003. NJ 2002 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 7/15/08

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ATTACHMENT B

Tables

Table 1
Sediment Analytical Data
Wetland Area, Pond 1
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County, New Jersey

Sample ID	P1S-1		P1S-2		P1S-3		S-18-1		S-18-2	
Lab Sample Number	09483-004		09483-005		09473-006		274098		274099	
Sampling Date	9/9/2005		9/9/2005		9/9/2005		5/10/2001		5/10/2001	
Matrix	Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
BNAs										
Acenaphthene	0.395	ND	0.145	ND	0.134	ND	0.015	J	0.046	J
Acenaphthylene	0.395	ND	0.145	ND	0.134	ND	0.062	J	0.029	J
Anthracene	0.395	ND	0.145	ND	0.178		0.09	J	0.15	J
Benzo(a)anthracene	0.364		0.145	ND	1.29		0.34		0.46	
Benzo(a)pyrene	0.381		0.145	ND	1.29		0.35		0.34	
Benzo(b)fluoranthene	0.355J		0.145	ND	0.948		0.6		0.67	
Benzo(g,h,i)perylene	0.318J		0.145	ND	0.783		0.33	J	0.12	J
Benzo(k)fluoranthene	0.387J		0.145	ND	1.01		0.15	J	0.22	
bis(2-Ethylhexyl)phthalate	10.4		0.121		0.134	ND	NA		NA	
Chrysene	0.571		0.145	ND	1.37		0.43	J	0.63	
Dibenz(a,h)anthracene	0.395	ND	0.145	ND	0.321		0.091	J	0.43	J
Diethylphthalate	0.488		0.145	ND	0.134	ND	0.87	J		ND
Di-n-butylphthalate	0.248		0.145	ND	0.134	ND	NA		NA	
Fluoranthene	0.539		0.145	ND	1.91		0.56	J	0.98	
Fluorene	0.395	ND	0.145	ND	0.134	ND	0.3	J	0.045	J
Indeno(1,2,3-cd)pyrene	0.297J		0.145	ND	0.758		0.31		0.13	
Naphthalene	0.395	ND	0.145	ND	0.134	ND	0.099	J	0.013	J
Phenanthrene	0.395	ND	0.145	ND	0.492		0.89	J	0.41	J
Pyrene	0.493		0.145	ND	1.71		0.72	J	0.92	
TPHC	2,200		50.3		222		299		79	
PCBs										
Aroclor-1016	0.141	ND	0.058	ND	0.05	ND	NA		NA	
Aroclor-1221	0.141	ND	0.058	ND	0.05	ND	NA		NA	
Aroclor-1232	0.141	ND	0.058	ND	0.05	ND	NA		NA	
Aroclor-1242	0.141	ND	0.058	ND	0.05	ND	NA		NA	
Aroclor-1248	0.141	ND	0.058	ND	0.05	ND	NA		NA	
Aroclor-1254	0.885		1.89		0.05	ND	NA		NA	
Aroclor-1260	0.141	ND	0.77		0.05	ND	NA		NA	
PCB total	0.885		2.66		0.05	ND	NA		NA	
Metals										
Antimony	4.05	ND	1.48	ND	1.34	ND		ND		ND
Arsenic	15.7		1.72		5.06		9.4		6.6	
Beryllium	2.03	ND	0.74	ND	0.67	ND	0.21	B	0.26	B
Cadmium	8.18		0.37	ND	0.67		1.7	B	0.79	B
Chromium	202		12.7		16.7		42.6		27	
Chromium VI	NA		NA		NA			ND		ND
Copper	367		43.9		73.7		165		111	
Lead	287		21.5		379		169		76.7	
Mercury	1.34		0.047		1.39		0.32		0.19	
Nickel	57.2		8.32		22.6		35.7		24.1	
Selenium	8.1	ND	2.96	ND	2.68	ND		ND		ND
Silver	2.03	ND	0.74	ND	0.67	ND		ND		ND
Thallium	0.48		0.148	ND	0.134	ND		ND		ND
Zinc	594		35.6		232		213		142	

Notes:

ND - The analyte was not detected at the indicated detection limits.

J - Estimated value below method detection limit.

NA - Not analyzed.

B - Concentration is above the method detection limit, but below the method reporting limit.

- Some method detection limits for ND samples were not available, so they are not displayed.

Table 1
Sediment Analytical Data
Wetland Area, Pond 2
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County, New Jersey

Sample ID	P2S-1		P2S-2		P2S-3	
Lab Sample Number	09483-007		09483-008		09483-009	
Sampling Date	9/9/2005		9/9/2005		9/9/2005	
Matrix	Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg	
BNAs						
Acenaphthene	0.314	ND	0.514	ND	0.471	ND
Acenaphthylene	0.314	ND	0.514	ND	0.471	ND
Anthracene	0.314	ND	0.514	ND	0.471	ND
Benzo(a)anthracene	0.459		0.548		1.11	
Benzo(a)pyrene	0.816		1.07		1.19	
Benzo(b)fluoranthene	0.674		0.837		1.08	
Benzo(g,h,i)perylene	0.632		0.695		0.912	
Benzo(k)fluoranthene	0.665		0.794		1.03	
bis(2-Ethylhexyl)phthalate	44.7		44.4		14.2	
Chrysene	0.752		0.833		1.2	
Dibenz(a,h)anthracene	0.314	ND	0.514	ND	0.482	
Diethylphthalate	4.4		0.714		6.52	
Di-n-butylphthalate	3.46		1.36		6.86	
Fluoranthene	0.722		0.726		1.58	
Fluorene	0.314	ND	0.514	ND	0.471	ND
Indeno(1,2,3-cd)pyrene	0.475		0.565		0.825	
Naphthalene	0.314	ND	0.514	ND	0.471	ND
Phenanthrene	0.312J		0.310J		0.537	
Pyrene	1.2		1.35		1.43	
TPHC	19,900		21,800		408	
PCBs						
Aroclor-1016	0.058	ND	0.107	ND	0.097	ND
Aroclor-1221	0.058	ND	0.107	ND	0.097	ND
Aroclor-1232	0.058	ND	0.107	ND	0.097	ND
Aroclor-1242	0.058	ND	0.107	ND	0.097	ND
Aroclor-1248	0.058	ND	0.107	ND	0.097	ND
Aroclor-1254	0.536		0.782		0.404	
Aroclor-1260	0.324		0.107	ND	0.097	ND
PCB total	0.86		0.782		0.404	
Metals						
Antimony	1.59	ND	2.75	ND	2.5	ND
Arsenic	9.06		15.5		9.76	
Beryllium	0.795	ND	1.38	ND	1.25	ND
Cadmium	16.2		17.5		13.8	
Chromium	78		94.6		55.2	
Copper	91.5		984		691	
Lead	2020		2210		1670	
Mercury	1.9		1.9		2.15	
Nickel	183		214		169	
Selenium	3.18	ND	5.5	ND	5	ND
Silver	5.35		5.42		3.14	
Thallium	0.159	ND	0.32		0.25	ND
Zinc	3850		4500		2950	

Qualifiers

ND - The analyte was not detected at the indicated detection limits.

J - Estimated value below method detection limit.

Table 1
Surface Water Analytical Data
Wetland Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny,Hudson County, New Jersey

Sample ID	P1-1		P1-2		P1-3	
Lab Sample Number	09483-001		09483-002		09483-003	
Sampling Date	9/9/2005		9/9/2005		9/9/2005	
Matrix	Liquid		Liquid		Liquid	
Units	µg/l		µg/l		µg/l	
Volatile Organic Compounds						
Chlorform	0.479		0.25	ND	0.25	ND
Tetrachloroethene	1.07		0.45	ND	0.45	ND
Trichloroethene	2.61		0.35	ND	0.35	ND
Metals						
Antimony	4	ND	4	ND	4	ND
Arsenic	4	ND	4	ND	4	ND
Beryllium	2	ND	2	ND	2	ND
Cadmium	1	ND	1	ND	1	ND
Chromium	25.1		8	ND	8	ND
Copper	10.7		11.6		8	ND
Lead	19.8		6.73		4.11	
Mercury	0.5	ND	0.5	ND	0.5	ND
Nickel	6.89		4	ND	4	ND
Selenium	8	ND	8	ND	8	ND
Silver	2	ND	2	ND	8.42	
Thallium	0.4	ND	0.4	ND	0.4	ND
Zinc	119		18.6		22.5	
PCB's						
Aroclor-1016	0.2	ND	0.2	ND	0.2	ND
Aroclor-1221	0.2	ND	0.2	ND	0.2	ND
Aroclor-1232	0.2	ND	0.2	ND	0.2	ND
Aroclor-1242	0.2	ND	0.2	ND	0.2	ND
Aroclor-1248	0.2	ND	0.2	ND	0.2	ND
Aroclor-1254	0.2	ND	0.2	ND	0.2	ND
Aroclor-1260	0.2	ND	0.2	ND	0.2	ND

Notes:
ND - The analyte was not detected at the indicated detection limit.

Table 1
Ground Water Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County, New Jersey

Sample ID	S-2-6GW		S-2-7GW		S-2-8GW		S-2-10GW		S-2-11GW		S-2-13GW	
Lab Sample Number	233912		233913		233914		233916		233917		233918	
Sampling Date	10/5/2000		10/5/2000		10/5/2000		10/5/2000		10/5/2000		10/5/2000	
Matrix	Liquid		Liquid		Liquid		Liquid		Liquid		Liquid	
Units	ug/L		ug/L		ug/L		ug/L		ug/L		ug/L	
Semivolatiles												
Acenaphthene	0.6	ND	0.6	ND	0.6	ND	120	ND	0.6	ND	0.6	ND
Acenaphthylene	0.5	ND	0.5	ND	0.5	ND	100	ND	0.5	ND	0.5	ND
Anthracene	0.3	ND	0.3	ND	3	ND	55	ND	0.3	ND	0.3	
Benzo(a)anthracene	0.4	ND	0.3	ND	0.4	ND	84	ND	0.4	ND	0.4	ND
Benzo(a)pyrene	0.2	ND	0.2	ND	0.2	ND	51	ND	0.3	ND	0.3	ND
Benzo(b)fluoranthene	0.4	ND	0.4	ND	0.4	ND	73	ND	0.4	ND	0.4	ND
Benzo(g,h,i)perylene	0.4	ND	0.4	ND	0.4	ND	92	ND	0.5	ND	0.5	ND
Benzo(k)fluoranthene	0.6	ND	0.6	ND	0.6	ND	130	ND	0.7	ND	0.7	ND
bis(2-Ethylhexyl)phthalate	2	ND	2	ND	2	ND	400	ND	2.1	ND	2.6	
Chrysene	0.6	ND	0.6	ND	0.6	ND	130	ND	0.7	ND	0.7	ND
Dibenz(a,h)anthracene	0.3	ND	0.3	ND	0.3	ND	57	ND	0.3	ND	0.3	ND
Diethylphthalate	3.0		0.5		1.2		80.0	ND	1.9		16.0	
Di-n-butylphthalate	0.5	ND	0.5	ND	0.5	ND	100	ND	0.5	ND	0.5	ND
Fluoranthene	0.5	ND	0.5	ND	0.5	ND	96	ND	0.5	ND	0.5	ND
Fluorene	0.7	ND	0.7	ND	0.7	ND	150	ND	0.8	ND	0.7	ND
Indeno(1,2,3-cd)pyrene	0.5	ND	0.5	ND	0.5	ND	100	ND	0.5	ND	0.5	ND
Naphthalene	0.8	ND	0.8	ND	0.8	ND	160	ND	0.8	ND	0.8	ND
Phenanthrene	0.5	ND	0.5	ND	0.5	ND	96	ND	0.5	ND	0.5	ND
Pyrene	0.6	ND	0.6	ND	0.6	ND	110	ND	0.6	ND	0.6	ND
4-Chlorophenyl-phenylether	0.5	ND	0.5	ND	0.5	ND	110	ND	0.6	ND	0.5	ND
N-Nitrosodiphenylamine	0.5	ND	0.5	ND	0.5	ND	98	ND	0.5	ND	0.5	ND
Hexachlorobenzene	0.6	ND	0.6	ND	0.6	ND	110	ND	0.6	ND	0.6	ND
Butylbenzylphthalate	0.7	ND	0.7	ND	0.7	ND	140	ND	0.7	ND	0.7	ND
Di-n-octylphthalate	0.3	ND	0.3	ND	0.3	ND	65	ND	0.3	ND	0.3	ND

Qualifiers

ND - The compound was not detected at the indicated method detection limit.

NA - indicates that the compound was not analyzed for this sample.

Table 1
Ground Water Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County, New Jersey

Sample ID	GW-5R		S-9-9W		S-9-15W		S-9-34W		GW-1		GW-2	
Lab Sample Number	270920		270911		270915		270916		217035		217041	
Sampling Date	4/26/2001		4/26/2001		4/26/2001		4/26/2001		7/13/2000		7/13/2000	
Matrix	Liquid		Water		Water		Water		Water		Water	
Units	ug/L		ug/L		ug/L		ug/L		mg/kg		mg/kg	
Semivolatiles												
Acenaphthene	3.2	ND	NA		NA		NA		NA		NA	
Acenaphthylene	3.2	ND	NA		NA		NA		NA		NA	
Anthracene	2.4	ND	1.1	ND	2.1	ND	0.5	ND	NA		NA	
Benzo(a)anthracene	2.1	ND	1	ND	1.9	ND	0.4	ND		ND		ND
Benzo(a)pyrene	0.8	ND	0.4	ND	0.8	ND	0.2	ND	NA		NA	
Benzo(b)fluoranthene	1.5	ND	2.1	ND	4.1	ND	0.3	ND	NA		NA	
Benzo(g,h,i)perylene	2	ND	0.09	ND	1.8	ND	0.4	ND	NA		NA	
Benzo(k)fluoranthene	4.6	ND	NA		NA		NA		NA		NA	
bis(2-Ethylhexyl)phthalate	5.4B		7.0B		5.7B		2.1B		11		4.6	
Chrysene	2.8	ND	1.2	ND	2.5	ND	0.5	ND	NA		NA	
Dibenz(a,h)anthracene	3.5	ND	NA		NA		NA		NA		NA	
Diethylphthalate	700.0		1.0	ND	3.5		5.7		6.1		3.0	
Di-n-butylphthalate	2.4	ND	NA		NA		NA		NA		NA	
Fluoranthene	2.3	ND	1.1	ND	2.1	ND	0.4	ND		ND		ND
Fluorene	3.4	ND	NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	0.8	ND	0.4	ND	0.7	ND	0.2	ND	NA		NA	
Naphthalene	3.5	ND	NA		NA		NA		NA		NA	
Phenanthrene	2.8	ND	1.2	ND	2.5	ND	0.5	ND	NA		NA	
Pyrene	2.4	ND	1.1	ND	2.1	ND	0.5	ND		ND		ND
4-Chlorophenyl-phenylether	4.7	ND	NA		NA		NA		NA		NA	
N-Nitrosodiphenylamine	2.9	ND	NA		NA		NA		NA		NA	
Hexachlorobenzene	6.2	ND	NA		NA		NA		NA		NA	
Butylbenzylphthalate	2.2	ND	NA		NA		NA		NA		NA	
Di-n-octylphthalate	0.7	ND	1	ND	0.7	ND	0.1	ND	NA		NA	
Volatile Organic Compounds												
Carbon Disulfide	0.2	ND	0.2	ND	0.2	ND	1		NA			
Acetone	1.5	ND	1.5	ND	14		27			ND		
cis-1,2-Dichloroethene	0.2	ND	0.4		0.2	ND		ND	1.4			
Chloroform	1.2		0.4		0.2	ND		ND		ND		
Trichloroethene	5.3		1.8		0.3	ND		ND		ND		
Tetrachloroethene	3.3		0.5		0.3	ND		ND		ND		
Toluene	0.2	ND	0.2	ND	0.2	ND		ND	29			
Ethylbenzene	0.2	ND	0.2	ND	0.2	ND		ND	1.4			
1,1-Dichloroethane	NA		NA		NA		NA		0.7			
Vinyl Chloride	NA		NA		NA		NA		1			
Xylene	0.2	ND	0.2	ND	0.2	ND		ND	110			

Qualifiers

ND - The compound was not detected at the indicated method detection limit.

NA - indicates that the compound was not analyzed for this sample.

Table 1
Ground Water Analytical Data
Wetland Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County, New Jersey

Sample ID	GW-8	
Lab Sample Number	217718	
Sampling Date	7/17/2000	
Matrix	Liquid	
Units	ug/L	
Volatile Organic Compounds		
Vinyl Chloride		ND
Acetone		ND
1,1-Dichloroethane		ND
cis-1,2-Dichloroethane		ND
Chloroform		ND
Trichloroethene		ND
Tetrachloroethene		ND
Toluene	1.4	
Ethylbenzene	0.6	
Xylene	2.9	

Qualifiers:

ND - The analyte was not detected at the indicated detection limits.

Table 1
Soil Sampling Analytical Data
Upland Successional Woodland
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-16-10		S-21-3	
Lab Sample Number	06918-009		274102	
Sampling Date	8/25/2006		5/10/2001	
Matrix	Solid		Solid	
Units	mg/kg		mg/kg	
Volatile Organic Compounds				
Ethylbenzene	NA			ND
Styrene	NA			ND
Toluene	NA			ND
Xylene	NA			ND
Chlorobenzene		ND	NA	
Total Petroleum Hydrocarbons	25	ND	NA	
Metals				
Antimony	NA		3.5	
Arsenic	2.38		5.2	
Beryllium	0.573	ND	0.36	
Cadmium	0.345		1	
Chromium	45.3		63.4	
Chromium VI	NA		4.4	
Copper	39.8		126	
Lead	62.9		172	
Mercury	0.434		0.27	
Nickel	12		22.6	
Selenium	2.29	ND	0.99	
Silver	0.573	ND	0.48	
Thallium	0.115	ND	1.1	
Zinc	110		300	
Polychlorinated Biphenyls				
Aroclor-1016	0.016	ND	NA	
Aroclor-1221	0.016	ND	NA	
Aroclor-1232	0.016	ND	NA	
Aroclor-1242	0.016	ND	NA	
Aroclor-1248	0.016	ND	NA	
Aroclor-1254	0.016	ND	NA	
Aroclor-1260	0.016	ND	NA	
Total PCBs	NA		0.87	
Semi-Volatile Compounds				
2,6-Dinitrotoluene	NA		0.080	
Acenaphthene	NA		0.035	
Acenaphthylene	0.232	ND	0.031	
Anthracene	0.232	ND	0.1	
Benzo(a)anthracene	0.232	ND	0.31	
Benzo(a)pyrene	0.232	ND	0.31	
Benzo(b)fluoranthene	0.232	ND	0.54	
Benzo(g,h,i)perylene	0.232	ND	0.078J	
Benzo(k)fluoranthene	0.232	ND	0.19	
bis(2-Ethylhexyl)phthalate	0.232	ND	2.2	
Butylbenzylphthalate	NA		0.36	
Chrysene	0.232	ND	0.38	
Dibenz(a,h)anthracene	0.232	ND	43	
Dimethylphthalate	NA		1.6	
Di-n-butylphthalate	0.232	ND		ND
Di-n-octylphthalate	NA			ND
Fluoranthene	0.232	ND	0.64	
Fluorene	0.232	ND	0.04	
Indeno(1,2,3-cd)pyrene	0.232	ND	0.084	
Naphthalene	0.232	ND	0.015	
Phenanthrene	0.232	ND	0.45	
Pyrene	0.230 J		0.66	

Notes:

ND - The analyte was not detected at the indicated detection limit

NA - Not analyzed

J- Estimated concentration below method detection limit

Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-2-4		S-2-5		S-2-12		S-2-13		S-2-14RE		S-2-15		S-2-16		S-2-17	
Lab Sample Number	217716				233929		2339230		2339231RE		2339232		2339233		2339234	
Sampling Date	7/14/2000		7/14/2000		10/5/2000		10/5/2000		10/5/2000		10/5/2000		10/5/2000		10/5/2000	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																
1,2-Dichlorobenzene		ND	0.013J			ND		ND		ND		ND		ND		ND
1,3-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene		ND	0.0095J			ND	0.025J			ND		ND		ND		ND
1,2,4-Trichlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	NA		NA			ND		ND		ND		ND		ND		ND
2-Chloronaphthalene	NA		NA			ND	0.01J			ND		ND		ND		ND
Acenaphthene	0.029J		0.032J		0.036J		0.051J			ND	3.1		0.091J		0.19J	
Acenaphthylene		ND	0.027		0.017J		0.03J			ND	0.36J		0.48J		0.50J	
Anthracene	0.03J		0.056J		0.12J		0.086J			ND	9.2		0.17J		0.42	
Benzo(a)anthracene	0.15		0.19		0.35		0.34			ND	13		0.75		1.1	
Benzo(a)pyrene	0.17		0.2		0.37		0.43		0.57B		11		1		1.4	
Benzo(b)fluoranthene	0.21		0.25		0.5		0.51		0.66		14		1.8		1.9	
Benzo(k)fluoranthene	0.089		0.13		0.26		0.22		0.26J		6.8		0.76		0.79	
Benzo[g,h,i]perylene	0.16J		0.14J		0.25J		0.19J		0.61J		3.3		0.14J		0.48	
Bis(2-Ethylhexyl)phthalate	0.23J		0.47J		0.091J			ND		ND		ND	0.13J		0.13J	
Butylbenzylphthalate	NA		NA		NA		NA		NA		NA		NA		NA	
Chrysene	0.18J		0.25J		0.41		0.45J			ND	14		0.93		1.2	
Dibenz(a,h)anthracene	0.046		0.035J		0.078		0.075			ND	1.3		0.047		0.21	
Diethylphthalate		ND		ND	0.22J		0.84		1.3			ND		ND		ND
Dimethylphthalate	NA		NA		NA		NA		NA		NA		NA		NA	
Di-n-butylphthalate		ND	.11J		NA		NA		NA		NA		NA		NA	
Fluoranthene	0.33J		0.36J		0.72		0.53		0.64J		32		1.2		2	
Fluorene	0.021J		0.031J		0.047J		0.049			ND	4.4		0.079J		0.19J	
Indeno[1,2,3-cd]pyrene	0.13		0.13		0.24		2		0.41		3.9		0.19		0.51	
Naphthalene		ND	0.033J		0.027J		0.1J			ND	0.68J		0.74J		0.74J	
Phenanthrene	0.2J		0.2J		0.5		0.38J		0.33J		34		0.76		1.6	
Pyrene	0.26J		0.3J		0.63		0.59		0.62J		27		1.4		1.8	
N-Nitrosodiphenylamine		ND	0.19J		NA		NA		NA		NA		NA		NA	
Total Petroleum Hydrocarbons	NA		NA		NA		NA		NA		NA		NA		NA	
Metals																
Antimony	NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	NA		NA		NA		NA		NA		NA		NA		NA	
Beryllium	NA		NA		NA		NA		NA		NA		NA		NA	
Cadmium	NA		NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		NA		NA	
Chromium VI	NA		NA		NA		NA		NA		NA		NA		NA	
Copper	NA		NA		NA		NA		NA		NA		NA		NA	
Lead	NA		NA		NA		NA		NA		NA		NA		NA	
Mercury	NA		NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA		NA	
Selenium	NA		NA		NA		NA		NA		NA		NA		NA	
Silver	NA		NA		NA		NA		NA		NA		NA		NA	
Thallium	NA		NA		NA		NA		NA		NA		NA		NA	
Zinc	NA		NA		NA		NA		NA		NA		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-2-18		S-7-1		S-7-2		S-7-3		S-7-4		S-7-5		PE-01		PE-02	
Lab Sample Number	2339235		217050		217051		217502		217053		217053		268484		268485	
Sampling Date	10/5/2000		7/14/2000		7/14/2000				7/14/2000		7/14/2000		4/12/2001		4/12/2001	
Matrix	Solid		Solid		Solid				Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																
1,2-Dichlorobenzene		ND		ND		ND		ND	0.28J		0.26J		NA		NA	
1,3-Dichlorobenzene	NA			ND		ND		ND		ND	0.4J		NA		NA	
1,4-Dichlorobenzene		ND		ND		ND	0.02J		0.7J		1.4J		NA		NA	
1,2,4-Trichlorobenzene	NA			ND		ND		ND	0.022J		0.14J		NA		NA	
2,6-DinitrotolNDene		ND	NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene		ND	NA		NA		NA		NA		NA		NA		NA	
Acenaphthene	0.36J		1.3J			ND	0.044J		0.073J		0.1J		NA		NA	
Acenaphthylene	0.58			ND		ND	0.023J		0.043J		0.54J		NA		NA	
Anthracene	1.5		1.3J			ND	0.092J		0.18J		1.2J		NA		NA	
Benzo(a)anthracene	3		2.8			ND	0.43		0.74		3.6		NA		NA	
Benzo(a)pyrene	2.7		1.7			ND	0.55		0.7		5.2		NA		NA	
Benzo(b)fluoranthene	5.1		2.6			ND	0.7		1.1		7.2		NA		NA	
Benzo(k)fluoranthene	2.5		1.3			ND	0.33		0.52		3.1		NA		NA	
Benzo(g,h,i)perylene	0.26J		0.5J			ND	0.48		0.34J		2.0J		NA		NA	
Bis(2-Ethylhexyl)phthalate	0.98		4.1J			ND		ND	4		0.58J		NA		NA	
Butylbenzylphthalate	NA			ND		ND		ND	0.19J			ND	NA		NA	
Chrysene	3		3.4J			ND	0.59		0.94		4.1		NA		NA	
Dibenz(a,h)anthracene	0.099		0.2J			ND	0.089		0.1		0.51		NA		NA	
Diethylphthalate	6		66		86		0.9		18		1.0J		NA		NA	
Dimethylphthalate	NA			ND		ND		ND	0.28J			ND	NA		NA	
Di-n-butylphthalate	NA			ND		ND		ND	0.62J			ND	NA		NA	
Fluoranthene	7.2		12			ND	0.76		1.5		5.8		NA		NA	
Fluorene	0.65		1.2			ND	0.033J		0.075J		0.22J		NA		NA	
Indeno(1,2,3-cd)pyrene	0.35		0.54			ND	0.42		0.38		2.6		NA		NA	
Naphthalene	0.34J		1.4J			ND	0.084J		0.12J		0.12J		NA		NA	
Total Petroleum Hydrocarbons	NA		NA		NA		NA		NA		NA		143		1,120	
Metals																
Antimony	NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	NA		NA		NA		NA		NA		NA		NA		NA	
Beryllium	NA		NA		NA		NA		NA		NA		NA		NA	
Cadmium	NA		NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		NA		NA	
Chromium VI	NA		NA		NA		NA		NA		NA		NA		NA	
Copper	NA		NA		NA		NA		NA		NA		NA		NA	
Lead	NA		NA		NA		NA		NA		NA		NA		NA	
Mercury	NA		NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA		NA	
Selenium	NA		NA		NA		NA		NA		NA		NA		NA	
Silver	NA		NA		NA		NA		NA		NA		NA		NA	
Thallium	NA		NA		NA		NA		NA		NA		NA		NA	
Zinc	NA		NA		NA		NA		NA		NA		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

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Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	PE-03	PE-04	PE-05	PE-06	S-9-3	S-9-A	S-9-B	S-9-C	
Lab Sample Number	268486	268487	268488	268489	217028	233935	233937	233938	
Sampling Date	4/12/2001	4/12/2001	4/12/2001	4/12/2001	7/13/2000	10/6/2000	10/6/2000	10/6/2000	
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Semivolatiles									
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	
2,6-DinitrotolNDene	NA	NA	NA	NA	NA	NA	NA	NA	
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	
Acenaphthene	NA	0.16J	NA	1.1J	NA	NA	NA		ND
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA		ND
Anthracene	NA	0.15J	NA	0.53J	NA	NA	NA		ND
Benzo(a)anthracene	NA	0.35	NA	0.73	NA	NA	NA		ND
Benzo(a)pyrene	NA	0.35	NA	0.83	NA	NA	NA		ND
Benzo(b)fluoranthene	NA	0.42	NA	0.88	NA	NA	NA		ND
Benzo(k)fluoranthene	NA	0.13J	NA	0.53J	NA	NA	NA		ND
Benzo(g,h,i)perylene	NA	0.39J	NA	0.24J	NA	NA	NA		ND
Bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	
Chrysene	NA	0.34J	NA	1.0J	NA	NA	NA	0.88J	
Dibenz(a,h)anthracene	NA	ND	NA	0.31	NA	NA	NA		ND
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	
Dimethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	
Fluoranthene	NA	0.54J	NA	0.72J	NA	NA	NA	0.16J	
Fluorene	NA	0.19J	NA	1.3J	NA	NA	NA		ND
Indeno(1,2,3-cd)pyrene	NA	0.19J	NA	0.37	NA	NA	NA		ND
Naphthalene	NA	0.63J	NA	2.0J	NA	NA	NA		ND
Total Petroleum Hydrocarbons	897	3,380	867	9,750	43	12,400	4,470	5,390	
Metals									
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	
Chromium VI	NA	NA	NA	NA	NA	NA	NA	NA	
Copper	NA	NA	NA	NA	NA	NA	NA	NA	
Lead	NA	NA	NA	NA	NA	NA	NA	NA	
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	
Silver	NA	NA	NA	NA	NA	NA	NA	NA	
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

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Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-9-D		S-9-E		Pit-C		Pit-D		Pit-E		J-9		J-6	
Lab Sample Number	233939		233940		234302		234303		234304		234305		234306	
Sampling Date	10/6/2000		10/6/2000		10/9/2000		10/9/2000		10/9/2000		10/9/2000		10/9/2000	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles														
1,2-Dichlorobenzene	NA		NA		0.27J			ND		ND		ND	0.76J	
1,3-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	NA		NA			ND		ND		ND		ND	0.046J	
1,2,4-Trichlorobenzene	NA		NA		NA		NA		NA		NA		NA	
2,6-DinitrotolNDene	NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	NA		NA		NA		NA		NA		NA		NA	
Acenaphthene		ND		ND	1.0J			ND		ND		ND	0.058J	
Acenaphthylene		ND		ND		ND		ND		ND		ND	0.088J	
Anthracene		ND		ND	2.1J			ND		ND		ND	0.074J	
Benzo(a)anthracene		ND	0.38J		9.5			ND		ND	0.37J		0.029	
Benzo(a)pyrene		ND	0.21J		5.9			ND	0.096J		0.21J		0.023	
Benzo(b)fluoranthene		ND	0.47	ND	9.8			ND	0.15J		0.34J			ND
Benzo(k)fluoranthene		ND		ND	3.7			ND	0.12J		0.15J		0.2J	
Benzo(g,h,I)perylene		ND		ND	2.9J			ND	0.14J		0.21J		0.12J	
Benzo(g,h,I)perylene														
Bis(2-Ethylhexyl)phthalate	NA		NA		3.5		1,300		20		38		3.5	
Butylbenzylphthalate	NA		NA		NA		NA		NA		NA		NA	
Chrysene		ND	0.28J		9.9J			ND	0.14J		0.27J		.4J	
Dibenz(a,h)anthracene		ND	0.085J		NA		NA		NA		NA		NA	
Diethylphthalate	NA		NA		170		700		85		42		36	
Dimethylphthalate	NA		NA		NA		NA		NA		NA		NA	
Di-n-butylphthalate	NA		NA		13J			ND	1.3J		0.84J			ND
Fluoranthene	0.21J		0.45J		16			ND	0.15J		0.37J		0.44J	
Fluorene		ND		ND	0.84J			ND		ND	0.18J			ND
Indeno[1,2,3-cd]pyrene		ND	0.12J		2.5			ND		ND	0.2J		0.11J	
Naphthalene		ND		ND	0.76J			ND		ND	0.27J		0.14J	
Total Petroleum Hydrocarbons	11,900		13,300		8.46		0.796		0.699		4.35		2.72	
Metals														
Antimony	NA		NA		NA		NA		NA		NA		NA	
Arsenic	NA		NA		NA		NA		NA		NA		NA	
Beryllium	NA		NA		NA		NA		NA		NA		NA	
Cadmium	NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		NA	
Chromium VI	NA		NA		NA		NA		NA		NA		NA	
Copper	NA		NA		NA		NA		NA		NA		NA	
Lead	NA		NA		NA		NA		NA		NA		NA	
Mercury	NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA	
Selenium	NA		NA		NA		NA		NA		NA		NA	
Silver	NA		NA		NA		NA		NA		NA		NA	
Thallium	NA		NA		NA		NA		NA		NA		NA	
Zinc	NA		NA		NA		NA		NA		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-21-1		S-21-2		S-15-1		S-15-2		S-15-3		S-7-8		S-7-9		S-7-10		S-7-11	
Lab Sample Number	274100		274101		274094		274095		274096		08570-001		08570-002		08570-003		08570-004	
Sampling Date	5/10/2001		5/10/2001		5/10/2001		5/10/2001		5/10/2001		8/15/2005		8/15/2005		8/15/2005		8/15/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																		
1,2-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,3-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA	
1,2,4-Trichlorobenzene	NA		NA		NA		NA		NA		NA		NA		NA		NA	
2,6-Dinitrotoluene	2.6		0.15		NA		NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Acenaphthene	0.29		0.12		0.071J		0.14J			ND	NA		NA		NA		NA	
Acenaphthylene	0.35		0.12		0.068J		0.054J			ND	0.316	ND	6.92	ND	0.236		0.333	ND
Anthracene	0.43		0.35		0.46J		0.61J			ND	0.316	ND	6.92	ND	0.328		0.333	ND
Benzo(a)anthracene	2.3		1.3		1.8		1.6			ND	0.206J		6.92	ND	1.15		0.263J	
Benzo(a)pyrene	2.1		1.3		1.9		1.3			ND	0.197J		6.92	ND	1.26		0.281J	
Benzo(b)fluoranthene	4.2		2.1		3.9		3.4			ND	0.316	ND	6.92	ND	0.991		0.333	ND
Benzo(k)fluoranthene	1.1		0.9		2		1.1			ND	0.19J		6.92	ND	1.28		0.285J	
Benzo(g,h,i)perylene	0.86J		0.42J		0.5J		0.4J			ND	0.316	ND	6.92	ND	1.02		0.239J	
Benzo(g,h,i)perylene																		
Bis(2-Ethylhexyl)phthalate	200		3.2		4.9		9.6B		760		1.11		6.92	ND	2.81		0.333	ND
Butylbenzylphthalate	16		0.87		0.3		0.93J			ND	0.316	ND	6.92	ND	0.503		0.333	ND
Chrysene	2		1.4		2.2		2.1J			ND	0.229J		6.92	ND	1.54		0.283J	
Dibenz(a,h)anthracene	1.3		0.12		0.14		0.24J			ND	0.316	ND	6.92	ND	0.245J		0.333	ND
Diethylphthalate	NA		NA		22		13		1,100		40.6		*868*		17.4		2.09	
Dimethylphthalate	13		0.75		NA		NA		NA		13.3		6.92	ND	0.486		0.333	ND
Di-n-butylphthalate		ND			0.58J		1.6J		21J		0.221J		6.92	ND	0.433		0.333	ND
Di-n-octylphthalate	20		0.26J			ND		ND		ND	NA		NA		NA			
Fluoranthene	3.5		3		3.8		3.6		4.2J		0.392		6.92	ND	2.89		0.369	
Fluorene	0.94		0.11		0.099J		0.15J			ND	NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	0.66		0.48		0.72		0.34			ND	0.316	ND	6.92	ND	0.831		0.219J	
Naphthalene	4.2		0.077		0.056J		0.12J			ND	NA		NA		NA		NA	
Total Petroleum Hydrocarbons	44,300		3,080		57,900		19,300		59,300		NA		NA		NA		NA	
Metals																		
Antimony	9.5		4.2		1.8B		1.7		3.6		NA		NA		NA		NA	
Arsenic	9.8		5.2		7.1		6		16.5		NA		NA		NA		NA	
Beryllium	0.32		0.42		0.25B		0.19B		0.72		NA		NA		NA		NA	
Cadmium	21.6		2.4		3.1		4.7		146		NA		NA		NA		NA	
Chromium	77.6		41.6		142		102		435		NA		NA		NA		NA	
Chromium VI	2		2		16.9		33.6		2		NA		NA		NA		NA	
Copper	1,150		174		453		295		849		NA		NA		NA		NA	
Lead	2,450		331		625		596		1,200		NA		NA		NA		NA	
Mercury	1.7		1.1		0.85		1.3		37.1		NA		NA		NA		NA	
Nickel	230		50.1		68.5		62.3		77.8		NA		NA		NA		NA	
Selenium	1.3		0.86			ND		ND			NA		NA		NA		NA	
Silver	8.7		0.78		0.85B		0.94B		3.3B		NA		NA		NA		NA	
Thallium	1.5		0.97			ND		ND			NA		NA		NA		NA	
Zinc	4,420		4.67		547		672		1,780		NA		NA		NA		NA	

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le 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-9-37		S-9-38		S-9-40		S-9-8		S-9-9		S-9-11		S-9-14		S-9-15		S-9-18	
Lab Sample Number	08692-003		08692-004		0819-002		270882		270883		270884		270885		270886		270888	
Sampling Date	8/17/2005		8/17/2005		8/25/2005		2/25/2001		2/25/2001		2/25/2001		2/25/2001		2/25/2001		2/25/2001	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																		
1,2-Dichlorobenzene	0.258	ND	0.24	ND	0.31	ND	2	ND	2.1	ND	1.9	ND	0.4	ND	2	ND	0.8	ND
1,3-Dichlorobenzene	0.258	ND	0.24	ND	0.31	ND												
1,4-Dichlorobenzene	0.258	ND	0.24	ND	0.31	ND												
1,2,4-Trichlorobenzene																		
2,6-Dinitrotoluene																		
2-Mehtylnapthalene	0.258	ND	0.431		0.204J													
Acenaphthene	0.258	ND	0.919		0.223J		2	ND	2.1	ND	1.9	ND	0.036J		0.049J		0.8	ND
Acenaphthylene							2	ND	2.1	ND	1.9	ND	0.044J		0.22J		0.8	ND
Anthracene	0.258	ND	2.64		0.383		2	ND	2.1	ND	1.9	ND	0.12J		0.40J		0.8	ND
Benzo(a)anthracene	0.657		9.32		1.12		0.2	ND	0.21	ND	0.19	ND	0.41		0.85		0.08	ND
Benzo(a)pyrene	0.597		8.63		1.03		0.2	ND	0.21	ND	0.19	ND	0.4		0.71		0.08	ND
Benzo(b)fluoranthene	0.571		7.24		0.958		0.2	ND	0.21	ND	0.19	ND	0.58		0.85		0.08	ND
Benzo(k)fluoranthene	0.672		6.5		0.873		0.2	ND	0.21	ND	0.19	ND	0.25		0.4		0.08	ND
Benzo(g,h,i)perylene	0.475		6.01		1.07		2	ND	2.1	ND	1.9	ND	0.24J		0.33J		0.8	ND
Benzo(g,h,i)perylene																		
Bis(2-Ethylhexyl)phthalate							2	ND	2.1	ND	1.9	ND	0.14J		2	ND	0.18J	
Carbazole	0.258	ND			0.206J													
Chrysene	0.886		9.91		1.35		2	ND	2.1	ND	1.9	ND	0.45		0.89J		0.8	ND
Dibenz(a,h)anthracene	0.217		2.87		0.454			ND	0.21	ND	0.19	ND	0.066		0.094J		0.08	ND
Diethylphthalate	0.258	ND	0.24	ND	0.31	ND	2	ND	2.1	ND	1.9	ND	0.96		2	ND	0.16	ND
Dibenzofuran	0.258	ND	0.561		0.294J													
Dimethylphthalate							2	ND	2.1	ND	1.9	ND	0.110J		2	ND	0.8	ND
Di-n-octylphthalate																		
Fluoranthene	1.1		16		2.13		0.096J		2.1	ND	0.048J		0.86		1.8J		0.8	ND
Fluorene	0.258	ND	0.697			ND	2	ND	2.1	ND	1.9	ND	0.039J		0.23J		0.80.8	ND
Indeno(1,2,3-cd)pyrene	0.437		5.94		0.875		0.2	ND	0.21	ND	0.19	ND	0.27		0.36		0.08	ND
Naphthalene	0.258	ND	0.623		0.324		2	ND	2.1	ND	1.9	ND	0.024J		0.11J		0.8	ND
Total Petroleum Hydrocarbons		ND	476		1480		NA		NA		NA		NA		NA		NA	
Metals																		
Antimony	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	79.9		9.82		28.1		NA		NA		NA		NA		NA		NA	
Beryllium		ND		ND		ND	NA		NA		NA		NA		NA		NA	
Cadmium		ND	0.31		0.957		NA		NA		NA		NA		NA		NA	
Chromium	18.8		15.6		21.7		NA		NA		NA		NA		NA		NA	
Chromium VI	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Copper	117		118		224		NA		NA		NA		NA		NA		NA	
Lead	216		96.9		1200		NA		NA		NA		NA		NA		NA	
Mercury	21.7		0.313		1.16		NA		NA		NA		NA		NA		NA	
Nickel	14.2		18.3		18.5		NA		NA		NA		NA		NA		NA	
Selenium	5.06			ND		ND	NA		NA		NA		NA		NA		NA	
Silver	2.59			ND		ND	NA		NA		NA		NA		NA		NA	
Thallium	0.529		0.284		0.241		NA		NA		NA		NA		NA		NA	
Zinc	52.4		160		528		NA		NA		NA		NA		NA		NA	

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le 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-9-19		S-21A		S-9-22		S-9-25		S-9-26A		S-9-27		S-9-30		S-9-31		S-9-32	
Lab Sample Number	270889		270890		270892		270893		270894		270896		270898		270899		270900	
Sampling Date	2/25/2001		2/25/2001		2/25/2001		2/25/2001		2/25/2001		2/25/2001		4/26/2001		4/26/2001		4/26/2001	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																		
1,2-Dichlorobenzene	0.39	ND	0.39	ND	0.42	ND	0.39	ND	0.41	ND	2.1	ND	0.4	ND	0.38	ND	0.41	ND
1,3-Dichlorobenzene																		
1,4-Dichlorobenzene																		
1,2,4-Trichlorobenzene																		
2,6-Dinitrotoluene																		
2-Methylnapthalene																		
Acenaphthene	0.39	ND	0.39	ND	0.42	ND	0.39	ND	0.047J		2.1	ND	0.026J		0.38	ND	0.14J	
Acenaphthylene	0.39	ND	0.39	ND	0.067J		0.39	ND	0.011J		2.1	ND	0.033J		0.38	ND	0.10J	
Anthracene	0.39	ND	0.0078J		0.046J		0.39	ND	0.076J		2.1	ND	0.085J		0.38	ND	0.30J	
Benzo(a)anihracene	0.039	ND	0.039J		0.59		0.039	ND	0.27		0.21	ND	0.28		0.038	ND	0.93	
Benzo(a)pyrene	0.039	ND	0.04		0.59		0.039	ND	0.24		0.21	ND	0.28		0.038	ND	1.2	
Benzo(b)fluoranthene	0.039	ND	0.055		0.83		0.039	ND	0.42		0.21	ND	0.37		0.038	ND	1.6	
Benzo(k)fluoranthene	0.039	ND	0.016J		0.43		0.039	ND	0.17		0.21	ND	0.17		0.038	ND	0.63	
Benzo[g,h,i]perylene	0.39	ND	0.03J		0.31J		0.0082		0.17J		2.1	ND	0.18J		0.38	ND	0.51	
Benzo(g,h,i)perylene																		
Bis(2-Ethylhexyl)phthalate	0.39	ND	0.27J		0.42	ND	0.39	ND	0.41	ND	2.1	ND	0.41		0.38	ND	0.41	ND
Cerbazole																		
Chrysene	0.39	ND	0.032J		0.75		0.39	ND	0.38J		2.1	ND	0.35		0.38	ND	1.1	
Dibenz(a,h)anthracene	0.039	ND	0.039	ND	0.092		0.039	ND	0.051		0.21	ND	0.048		0.038	ND	0.16	
Diethylphthalate	0.39	ND	0.39	ND	0.42	ND	0.39	ND	0.41	ND	2.1	ND	0.54		0.38	ND	0.41	ND
Dibenzofuran																		
Dimethylphthalate	0.39	ND	0.39	ND	0.42	ND	0.39	ND	0.41	ND	2.1	ND		ND	0.38	ND	0.41	ND
Di-n-octylphthalate																		
Fluoranthene	0.39	ND	0.048J		0.93		0.013J		0.74		0.12J		0.55		0.38	ND	1.7	
Fluorene	0.39	ND	0.39	ND	0.42	ND	0.39	ND	0.060J		2.1	ND	0.029J		0.38	ND	0.18J	
Indeno[1,2,3-cd]pyrene	0.039	ND	0.033J		0.38		0.039	ND	0.18		0.21	ND	0.19		0.038	ND	0.6	
Naphthalene	0.39	ND	0.39	ND	0.027J		0.39	ND	0.12J		2.1	ND	0.36J		0.38	ND	0.37J	
Total Petroleum Hydrocarbons	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Metals																		
Antimony	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Beryllium	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Cadmium	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Chromium	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Chromium VI	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Copper	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Lead	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Mercury	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Nickel	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Selenium	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Silver	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Thallium	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Zinc	NA		NA		NA		NA		NA		NA		NA		NA		NA	

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le 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-9-33		S-9-34		S-15-10		S-15-11		S-15-12		S-15-13		S-15-14		S-15-15	
Lab Sample Number	270901		270902		08691-006		08691-007		08571-011		08571-012		08571-009		08691-008	
Sampling Date	4/26/2001		4/26/2001		8/17/2005		8/17/2005		8/17/2005		8/17/2005		8/17/2005		8/17/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																
1,3-Dichlorobenzene	0.26J		0.38	ND	0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
1,4-Dichlorobenzene					0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
1,2-Dichlorobenzene					0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
Naphthalene					1.23		0.229	ND	2.10		0.232	ND	0.573		0.633	
2-Methylnaphthalene					0.403		0.229	ND	0.653		0.232	ND	0.184 J		0.454	
Acenaphthylene					0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
3-Nitroaniline	0.22J		0.38	ND	0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
Acenaphthene	0.049J		0.38	ND	0.317		0.229	ND	1.06		0.232	ND	0.193 J		0.262	ND
Dibenzofuran	0.41J		0.38	ND	0.416		0.229	ND	0.869		0.232	ND	0.228 J		0.198 J	
Diethylphthalate	0.68		0.038	ND	0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
Phenanthrene	0.62		0.038	ND	2.54		0.429		8.44		0.144 J		3.34		1.38	
Fluorene	0.82		0.038	ND	0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
Anthracene	0.35		0.038	ND	0.655		0.229	ND	3.05		0.232	ND	1.16		0.262	ND
Carbazole	0.290J		0.38	ND	0.177 J		0.229	ND	0.419		0.232	ND	0.254	ND	0.262	ND
Di-n-butylphthalate					0.153 J		0.229	ND	0.260		0.232	ND	0.254	ND	0.262	ND
Fluoranthene	0.270J		0.38	ND	3.98		0.721		17.7		0.275		9.45		1.73	
Pyrene					3.48		0.632		15.3		0.230 J		7.45		1.41	
Butylbenzylphthalate					0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
Benzo[a]anthracene	0.84		0.38	ND	2.67		0.378		10.8		0.179 J		5.16		1.34	
Chrysene	0.098		0.038	ND	3.44		0.459		11.9		0.207 J		6.58		2.34	
bis(2-Ethylhexyl)phthalate	0.420J		0.38	ND	0.239	ND	0.229	ND	0.23	ND	0.282		0.254	ND	0.262	ND
Di-n-octylphthalate					0.239	ND	0.229	ND	0.23	ND	0.232	ND	0.254	ND	0.262	ND
Benzo[b]fluoranthene		ND	0.38	ND	2.24		0.227 J		8.63		0.232	ND	4.15		1.48	
Benzo[k]fluoranthene					2.26		0.251		8.44		0.232	ND	3.53		1.06	
Benzo[a]pyrene	1.6		0.38	ND	2.50		0.302		11.0		0.232	ND	4.57		1.33	
Indeno[1,2,3-cd]pyrene	0.240J		0.38	ND	1.91		0.191J		7.37		0.232	ND	3.25		1.17	
Dibenz[a,h]anthracene	0.31		0.038	ND	0.824		0.229	ND	2.94		0.232	ND	1.40		0.523	
Benzo[g,h,i]perylene	0.28J		0.38	ND	1.92		0.214 J		7.61		0.232	ND	3.32		1.28	
Total Petroleum Hydrocarbons	NA		NA		513		91.7		4950			ND		ND		ND
Metals																
Antimony	NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	NA		NA		15		1.86		11.2		2.74		19.8		44.8	
Beryllium	NA		NA		0.654		0.757			ND	0.648		0.772			ND
Cadmium	NA		NA		0.466			ND	0.546			ND	0.525			ND
Chromium	NA		NA		10.9		20.1		16.9		19.3		22.8		22.8	
Chromium VI	NA		NA		NA		NA									
Copper	NA		NA		77.3		61.2		83.8		56.5		586		98.8	
Lead	NA		NA		56.9		14.6		85.1		30.3		420		234	
Mercury	NA		NA		0.302		0.081		0.231		0.377		0.556		0.382	
Nickel	NA		NA		13.8		16		19.3		16.8		18.2		20.6	
Selenium	NA		NA			ND		ND		ND		ND	3.39		3.29	
Silver	NA		NA			ND		ND		ND		ND		ND		ND
Thallium	NA		NA		0.192		0.13		0.202		0.139		0.67		0.344	
Zinc	NA		NA		91.3		46		131		123		127		76.8	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-15-16		S-15-17		S-15-23		S-15-24		S-15-25		S-15-28		S-15-29		S-15-30	
Lab Sample Number	08571-010		08571-013		08571-020		08571-021		08571-022		08571-025		08571-026		08571-027	
Sampling Date	8/17/2005		8/17/2005		2/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																
1,3-Dichlorobenzene		ND		ND	0.276	ND	0.662	ND	1.1	ND	0.206	ND	0.223	ND	0.224	ND
1,4-Dichlorobenzene		ND		ND	0.276	ND	0.662	ND	1.1	ND	0.206	ND	0.223	ND	0.224	ND
1,2-Dichlorobenzene		ND		ND			0.662	ND	1.1	ND	0.206	ND	0.223	ND	0.224	ND
Naphthalene		ND	0.249		0.276	ND	1.56		1.1	ND	0.206	ND	0.223	ND	0.224	ND
2-Methylnaphthalene		ND	0.229 J		0.313		1.73		1.1	ND	0.206	ND	0.223	ND	0.224	ND
Acenaphthylene		ND		ND	0.276	ND	2.09		1.1	ND	0.206	ND	0.223	ND	0.224	ND
3-Nitroaniline		ND		ND	0.276	ND	0.662	ND	1.1	ND	0.206	ND	0.223	ND	0.224	ND
Acenaphthene		ND		ND	0.276	ND	0.696		2.11		0.206	ND	0.223	ND	0.224	ND
Dibenzofuran		ND		ND	0.276	ND	0.687		1.1	ND	0.206	ND	0.223	ND	0.224	ND
Diethylphthalate		ND		ND	0.170 J		71.0		1.50		0.206	ND	0.223	ND	0.224	ND
Phenanthrene	0.251J		1.42		0.276	ND	9.04		16.2		0.206	ND	0.223	ND	0.224	ND
Fluorene		ND		ND	0.276	ND	1.42		1.27		0.206	ND	0.223	ND	0.224	ND
Anthracene		ND	0.154 J		0.276	ND	2.07		4.54		0.206	ND	0.223	ND	0.224	ND
Carbazole		ND		ND	0.276	ND	2.08		1.74		0.206	ND	0.223	ND	0.224	ND
Di-n-butylphthalate		ND		ND	13.2		0.685		1.1	ND	0.206	ND	0.223	ND	0.224	ND
Fluoranthene	0.436		1.19		0.276	ND	11.1		46.7		0.206	ND	0.212 J		0.224	ND
Pyrene	0.426		1.04		0.276	ND	7.04		33.9		0.206	ND	0.199 J		0.139 J	
Butylbenzylphthalate		ND		ND	0.276	ND	0.662	ND	1.1	ND	0.206	ND	0.223	ND	0.224	ND
Benzo[a]anthracene	0.308		0.727		0.276	ND	5.91		21.9		0.206	ND	0.159 J		0.224	ND
Chrysene	0.420		2.11		0.276	ND	8.58		23.9		0.206	ND	0.166 J		0.224	ND
bis(2-Ethylhexyl)phthalate		ND	0.181J		0.571		82.1		2.60		0.206	ND	0.223	ND	0.224	ND
Di-n-octylphthalate		ND		ND	0.276	ND	0.915		1.1	ND	0.206	ND	0.223	ND	0.224	ND
Benzo[b]fluoranthene	0.238 J		0.866		0.276	ND	9.89		19.9		0.206	ND	0.223	ND	0.224	ND
Benzo[k]fluoranthene	0.265		0.425		0.184 J		7.26		16.7		0.206	ND	0.223	ND	0.224	ND
Benzo[a]pyrene	0.272		0.667		0.235 J		8.93		22.5		0.206	ND	0.139 J		0.224	ND
Indeno[1,2,3-cd]pyrene	0.188 J		0.507		0.189 J		7.37		15.9		0.206	ND	0.223	ND	0.224	ND
Dibenz[a,h]anthracene		ND	0.316		0.276	ND	3.18		6.77		0.206	ND	0.223	ND	0.224	ND
Benzo[g,h,i]perylene	0.208 J		0.506		0.190 J		7.06		17.5		0.206	ND	0.223	ND	0.224	ND
Total Petroleum Hydrocarbons	177		433		147		11500		1680		857		1290		25	ND
Metals																
Antimony	NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	20.8		19.8		35.2		11.8		4.9		1.73		7.63		1.57	
Beryllium	0.817		0.838		0.772	ND	0.957	ND	0.63	ND	0.916		0.725		0.794	
Cadmium	0.534		0.391		2.52		17.2		1.8		0.288	ND	0.296	ND	0.3	ND
Chromium	26		11.2		56.9		202		298		26.9		15.7		13.5	
Chromium VI	NA		NA		NA		NA		NA		NA		NA		NA	
Copper	60		58.6		1370		550		220		55.9		381		54.5	
Lead	395		192		171		612		25.3		140		95.2		19.7	
Mercury	0.458		1.08		0.587		1.66		0.117		0.032		0.366		0.079	
Nickel	15.3		10.6		36.7		33.1		30.8		24.9		16		15.3	
Selenium		ND	3.38		3.75		3.83	ND	2.52	ND	2.3	ND	2.37	ND	2.4	ND
Silver		ND		ND	0.772	ND	1.22		0.63	ND	0.575	ND	0.593	ND	0.6	ND
Thallium	0.67		1.04		0.372		0.191	ND	0.135		0.23				0.12	ND
Zinc	127		94.5		475		1360		346		79.2				68.4	

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Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-15-31		S-16-5		S-16-9		S-16-11		S-16-12		S-16-13		S-16-14		S-16-15	
Lab Sample Number	08571-028		08918-004		08918-008		08918-010		08918-011		08918-012		08918-013		08918-014	
Sampling Date	8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles																
1,3-Dichlorobenzene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.217 J		0.235	ND
1,4-Dichlorobenzene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.633		0.235	ND
1,2-Dichlorobenzene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.986		0.235	ND
Naphthalene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.230 J		3.26	
2-Methylnaphthalene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.708		8.16	
Acenaphthylene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.263	ND	0.235	ND
3-Nitroaniline	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.263	ND	0.235	ND
Acenaphthene	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.257 J		1.41	
Dibenzofuran	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.263	ND	0.445	
Diethylphthalate	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.649		1.10		0.327	
Phenanthrene	0.871		0.203	ND		ND	0.225	ND	0.231	ND	0.252	ND	0.263	ND	0.235	ND
Fluorene	0.213	ND	0.203	ND	0.270		0.225	ND	0.231	ND	0.696		5.91		5.95	
Anthracene	0.233		0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.800		0.935	
Carbazole	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.270		0.235	ND
Di-n-butylphthalate	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	1.51		0.235	ND
Fluoranthene	3.65		0.203	ND	0.270		0.225	ND	0.231	ND	0.696		5.91		5.95	
Pyrene	3.53		0.203	ND	0.231 J		0.225	ND	0.231	ND	0.613		4.96		4.79	
Butylbenzylphthalate	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.263	ND	0.235	ND
Benzo[a]anthracene	2.15		0.203	ND	0.148 J		0.225	ND	0.231	ND	0.376		3.61		2.99	
Chrysene	2.55		0.203	ND	0.179 J		0.225	ND	0.231	ND	0.419		3.85		3.18	
bis(2-Ethylhexyl)phthalate	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.714 J		0.245 J		1.17	
Di-n-octylphthalate	0.213	ND	0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	0.263	ND	0.235	ND
Benzo[b]fluoranthene	1.95		0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.300		2.41		2.00	
Benzo[k]fluoranthene	1.63		0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.355		3.12		2.14	
Benzo[a]pyrene	2.29		0.203	ND	0.160 J		0.225	ND	0.231	ND	0.409		3.33		2.35	
Indeno[1,2,3-cd]pyrene	1.53		0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.275		2.07		1.47	
Dibenz[a,h]anthracene	0.563		0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.252	ND	1.03		0.701	
Benzo[g,h,i]perylene	1.77		0.203	ND	0.235	ND	0.225	ND	0.231	ND	0.359		2.15		1.52	
Total Petroleum Hydrocarbons	93.4			ND	27.1			ND		ND	46.3		46.5		10300	
Metals																
Antimony	NA		NA		NA		NA		NA		NA		NA		NA	
Arsenic	1.54		2.44		3.32		2.22		2.51		6.64		15.5		10.4	
Beryllium	0.599		1.29			ND	0.568	ND	0.575	ND	0.802		0.89		0.657	
Cadmium	0.296	ND	0.294	ND	0.474		0.284	ND	0.288	ND	3.8		4.23		3.14	
Chromium	12.4		60.8		15.5		14		11.4		60.4		41.9		22.1	
Chromium VI	NA		NA		NA		NA		NA		NA		NA		NA	
Copper	55.6		161		43.8		33.8		28.1		157		275		268	
Lead	14		10.6		51.6		120		49.63		152		242		577	
Mercury	0.06		0.015	ND	0.098		0.394		0.275		0.504		1.6		0.47	
Nickel	12.9		35.6		10.9		10.9		11.5		23.6		20.1		45.1	
Selenium	2.37	ND	2.35	ND		ND	2.27	ND	2.3	ND	2.69	ND	2.72	ND	2.53	ND
Silver	0.593	ND	0.588	ND		ND	0.568	ND	0.575	ND	0.801		0.68	ND	0.719	
Thallium	0.119	ND	0.354			ND	0.125		0.115	ND	0.15		0.208		0.381	
Zinc	51.7		82.3		99.9		66		60		503		361		665	

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Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-16-2		S-16-3		S-16-4		S-16-6		S-16-7		S-16-8		S-16-10	
Lab Sample Number	08918-001													
Sampling Date	8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Semivolatiles														
1,3-Dichlorobenzene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
1,4-Dichlorobenzene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
1,2-Dichlorobenzene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Naphthalene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
2-Methylnaphthalene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Acenaphthylene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
3-Nitroaniline														
Acenaphthene														
Dibenzofuran	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Diethylphthalate	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Phenanthrene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Fluorene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Anthracene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Carbazole	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Di-n-butylphthalate	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Fluoranthene	0.212	ND	0.223	ND	0.237	ND	0.237J		0.234	ND	0.226	ND	0.232	ND
Pyrene	0.212	ND	0.223	ND	0.237	ND	0.188J		0.234	ND	0.226	ND	0.230J	
Butylbenzylphthalate														
Benzo[a]anthracene	0.212	ND	0.223	ND	0.237	ND	0.165J		0.234	ND	0.226	ND	0.232	ND
Chrysene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
bis(2-Ethylhexyl)phthalate	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Di-n-octylphthalate														
Benzo[b]fluoranthene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Benzo[k]fluoranthene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Benzo[a]pyrene	0.212	ND	0.223	ND	0.237	ND	0.168J		0.234	ND	0.226	ND	0.232	ND
Indeno[1,2,3-cd]pyrene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Dibenz[a,h]anthracene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Benzo[g,h,i]perylene	0.212	ND	0.223	ND	0.237	ND	0.269	ND	0.234	ND	0.226	ND	0.232	ND
Total Petroleum Hydrocarbons	266		117			ND	38.4		25.7		34.5		ND	
Metals														
Antimony	NA		NA		NA		NA		NA		NA		NA	
Arsenic	22.8		2.67		1.85		7.55		2.46		3.1		NA	
Beryllium	2.11		1.14		1.3		0.726	ND	0.759		0.595	ND	NA	
Cadmium	2.28		0.446			ND	0.478		0.295	ND	0.298	ND	NA	
Chromium	94		34.3		29.8		50.6		21.9		16		NA	
Chromium VI	NA		NA		NA		NA		NA		NA		NA	
Copper	452		146		18.8		65.3		88.6		41		NA	
Lead	27.8		18.2		13.8		58.8		35.6		189		NA	
Mercury	0.014	ND	0.058		0.015	ND	0.209		0.088		0.089		NA	
Nickel	37.6		35.7		39		18.9		22.1		16.3		NA	
Selenium	2.2	ND	2.33	ND	2.4	ND	2.9	ND	2.36	ND	2.38	ND	NA	
Silver	0.55	ND	0.583	ND	0.6	ND	0.726	ND	0.59	ND	0.595	ND	NA	
Thallium	0.139		0.344		0.392		0.198		0.198		0.119	ND	NA	
Zinc	327		127		87.9		181		80		79.9		NA	

ND- The analyte was not detected at the indicated detection limit
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J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-1-1		S-1-2		S-1-3		S-1-4		S-1-5		S-1-7		S-3-1	
Lab Sample Number	217705		217708		217709		217710		217711		217720		217713	
Sampling Date	7/17/2000		7/17/2000		7/17/2000		7/17/2000		7/17/2000		7/17/2000		7/17/2000	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor														
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	1			ND		ND		ND		ND	1.3		14	
2-Butanone		ND		ND		ND		ND		ND	3			ND
Trichloroethene		ND		ND		ND		ND		ND		ND	0.49	
Toluene		ND		ND		ND		ND		ND		ND	0.84J	
Ethylbenzene		ND		ND		ND		ND		ND		ND		ND
Xylene		ND		ND		ND		ND		ND		ND	.11J	
Benzene	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		NA		NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene	NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA	
1,2-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA	
Polychlorinated Biphenyls														
Aroclor-1016	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1221	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1232	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1242	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1248	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1254	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1260	NA		NA		NA		NA		NA		NA		NA	
Total PCBs	NA		NA		NA		NA		NA		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-3-2		S-3-3		Pit-C		Pit-D		Pit-E		J-9		J-6	
Lab Sample Number	217714		217715		234302		234303		234304		234305		234306	
Sampling Date	7/17/2000		7/17/2000		10/9/2000		10/9/2000		10/9/2000		10/9/2000		10/9/2000	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor														
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	1.6		2.6		NA		NA		NA		NA		NA	
2-Butanone	3.2		3.3		NA		NA		NA		NA		NA	
Trichloroethene		ND		ND		ND		ND		ND		ND	0.12J	
Toluene		ND		ND		ND		ND		ND	0.13J			ND
Ethylbenzene		ND	0.79J		0.24J			ND		ND	0.22J			ND
Xylene		ND	0.54J		0.21J			ND		ND	0.17J			ND
Benzene	NA		NA			ND		ND		ND	0.15J			ND
Tetrachloroethene	NA		NA			ND	0.17J			ND		ND		ND
Trichlorfluoromethane	NA		NA		2.6		0.5J		1.2		0.49J			ND
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene	NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA	
1,2-Dichlorobenzene	NA		NA		NA		NA		NA		NA		NA	
Polychlorinated Biphenyls														
Aroclor-1016	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1221	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1232	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1242	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1248	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1254	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1260	NA		NA		NA		NA		NA		NA		NA	
Total PCBs	NA		NA		NA		NA		NA		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-21-1		S-21-2		S-15-1		S-15-2		S-15-3		S-9-40	
Lab Sample Number	274100		274101		274094		274095		274096		0819-002	
Sampling Date	5/10/2001		5/10/2001								8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor												
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds												
Acetone	NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		NA	
Trichloroethene	NA		NA		0.9			ND		ND	NA	
Toluene	3			ND	0.15J			ND		ND	NA	
Ethylbenzene	0.69			ND	0.098J		0.11J			ND	NA	
Xylene	4.1			ND	0.13J		0.1J		0.76J		NA	
Benzene	NA		NA			ND		ND		ND	NA	
Tetrachloroethene	NA		NA		0.46		0.13J			ND	NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA	
Styrene	0.46			ND	NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		0.095J			ND		ND	NA	
Chlorobenzene	NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	NA		NA		NA		NA		NA		NA	
1,2-Dichlorobenzene	NA		NA		NA		NA		NA		NA	
Polychlorinated Biphenyls												
Aroclor-1016	NA		NA		NA		NA		NA			ND
Aroclor-1221	NA		NA		NA		NA		NA			ND
Aroclor-1232	NA		NA		NA		NA		NA			ND
Aroclor-1242	NA		NA		NA		NA		NA			ND
Aroclor-1248	NA		NA		NA		NA		NA			ND
Aroclor-1254	NA		NA		NA		NA		NA			ND
Aroclor-1260	NA		NA		NA		NA		NA			ND
Total PCBs	7.7		0.47		NA		NA		NA		NA	

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Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-15-10		S-15-11		S-15-12		S-15-13		S-15-14		S-15-15		S-15-16	
Lab Sample Number	08691-006		08691-007		08571-011		08571-012		08571-009		08691-008		08571-010	
Sampling Date	8/17/2005		8/17/2005		8/17/2005		8/17/2005		8/17/2005		8/17/2005		8/17/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor														
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	NA		NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		NA		NA	
Trichloroethene		ND		ND		ND		ND		ND		ND		ND
Toluene		ND		ND		ND		ND		ND		ND		ND
Ethylbenzene		ND		ND		ND		ND		ND		ND		ND
Xylene		ND		ND		ND		ND		ND		ND		ND
Benzene	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		NA		NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene		ND		ND		ND		ND		ND		ND		ND
1,4-Dichlorobenzene		ND		ND		ND		ND		ND		ND		ND
1,2-Dichlorobenzene		ND		ND		ND		ND		ND		ND		ND
Polychlorinated Biphenyls														
Aroclor-1016	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1221	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1232	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1242	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1248	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1254	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1260	NA		NA		NA		NA		NA		NA		NA	
Total	NA		NA		NA		NA		NA		NA		NA	

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Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-15-17		S-15-23		S-15-24		S-15-25		S-15-28		S-15-29		S-15-30	
Lab Sample Number	08571-013		08571-020		08571-021		08571-022		08571-025		08571-026		08571-027	
Sampling Date	8/17/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor														
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	NA		NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		NA		NA	
Trichloroethene		ND	0.882	ND	0.587	ND	0.529	ND	0.567	ND	0.585	ND	0.0509	ND
Toluene		ND	0.882	ND	0.54J		0.529	ND	0.567	ND	0.585	ND	0.0509	ND
Ethylbenzene		ND	0.882	ND	0.713		0.218J		0.567	ND	0.585	ND	0.0509	ND
Xylene		ND	0.882	ND	3.56		0.529	ND	0.567	ND	0.585	ND	0.0509	ND
Benzene	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		NA		NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene		ND	4.26		1.8		0.529	ND	0.567	ND	0.585	ND	0.0509	ND
1,4-Dichlorobenzene		ND	0.737J		0.325J		0.529	ND	0.567	ND	0.585	ND	0.0509	ND
1,2-Dichlorobenzene		ND	1.48		0.587	ND	0.529	ND	0.567	ND	0.585	ND	0.0509	ND
Polychlorinated Biphenyls														
Aroclor-1016	NA		0.021	ND	0.027	ND	NA		NA		NA		NA	
Aroclor-1221	NA		0.021	ND	0.027	ND	NA		NA		NA		NA	
Aroclor-1232	NA		0.021	ND	0.027	ND	NA		NA		NA		NA	
Aroclor-1242	NA		0.021	ND	0.027	ND	NA		NA		NA		NA	
Aroclor-1248	NA		0.021	ND	0.027	ND	NA		NA		NA		NA	
Aroclor-1254	NA		0.021	ND	0.819		NA		NA		NA		NA	
Aroclor-1260	NA		0.021	ND	0.027	ND	NA		NA		NA		NA	
Total PCBs	NA		NA		NA		NA		NA		NA		NA	

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NA- Not analyzed
J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-15-31		S-16-5		S-16-9		S-16-11		S-16-12		S-16-13		S-16-14	
Lab Sample Number	08571-028		08918-004		08918-008		08918-010		08918-011		08918-012		08918-013	
Sampling Date	8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor														
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	NA		NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		NA		NA	
Trichloroethene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
Toluene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
Ethylbenzene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
Xylene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
Benzene	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		NA		NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
1,4-Dichlorobenzene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
1,2-Dichlorobenzene	0.556	ND		ND	0.65	ND	0.599	ND	0.501	ND	0.775	ND	0.7	ND
Polychlorinated Biphenyls														
Aroclor-1016	NA		NA		NA			ND		ND	NA		NA	
Aroclor-1221	NA		NA		NA			ND		ND	NA		NA	
Aroclor-1232	NA		NA		NA			ND		ND	NA		NA	
Aroclor-1242	NA		NA		NA			ND		ND	NA		NA	
Aroclor-1248	NA		NA		NA			ND		ND	NA		NA	
Aroclor-1254	NA		NA		NA			ND		ND	NA		NA	
Aroclor-1260	NA		NA		NA			ND		ND	NA		NA	
Total	NA		NA		NA		NA		NA		NA		NA	

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NA- Not analyzed
J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-16-15		S-16-2		S-16-3		S-16-4		S-16-6		S-16-7		S-16-8	
Lab Sample Number	08918-014		08918-001		08918-002		08918-003		08918-005		08918-006		08918-007	
Sampling Date	8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005		8/25/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor			1		1		1							
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	NA		NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		NA		NA	
Trichloroethene	0.519	ND	NA		NA		NA		NA		NA		NA	
Toluene	0.519	ND	NA		NA		NA		NA		NA		NA	
Ethylbenzene	0.519	ND	NA		NA		NA		NA		NA		NA	
Xylene	0.519	ND	NA		NA		NA		NA		NA		NA	
Benzene	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		NA		NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene		15	0.586	ND	0.574	ND	0.576	ND	0.668	ND	0.511	ND	0.52	ND
Polychlorinated Biphenyls														
Aroclor-1016	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Aroclor-1221	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Aroclor-1232	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Aroclor-1242	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Aroclor-1248	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Aroclor-1254	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Aroclor-1260	NA		NA		NA		NA		0.022	ND	0.017	ND	0.017	ND
Total	NA		NA		NA		NA		NA		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID	S-5-3		S-6-3		S-6-4		S-6-5		S-6-6		S-6-7		S-6-8	
Lab Sample Number	09306-002		274108		274109		274110		274111		274112		09306-001	
Sampling Date	9/6/2005		5/10/2001		5/10/2001		5/10/2001		5/10/2001		5/10/2001		9/6/2005	
Matrix	Solid		Solid		Solid		Solid		Solid		Solid		Solid	
Dilution Factor														
Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Volatile Organic Compounds														
Acetone	NA		NA		NA		NA		NA		NA		NA	
2-Butanone	NA		NA		NA		NA		NA		NA		NA	
Trichloroethene	NA		NA		NA		NA		NA		NA		NA	
Toluene	NA		NA		NA		NA		NA		NA		NA	
Ethylbenzene	NA		NA		NA		NA		NA		NA		NA	
Xylene	NA		NA		NA		NA		NA		NA		NA	
Benzene	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	NA		NA		NA		NA		NA		NA		NA	
Trichlorfluoromethane	NA		NA		NA		NA		NA		NA		NA	
Styrene	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene	NA		NA		NA		NA		NA		NA		NA	
Polychlorinated Biphenyls			NA		NA		NA		NA		NA		NA	
Aroclor-1016		ND	NA		NA		NA		NA		NA		0.10842857	ND
Aroclor-1221		ND	NA		NA		NA		NA		NA		0.12557143	ND
Aroclor-1232		ND	NA		NA		NA		NA		NA		0.14271429	ND
Aroclor-1242		ND	NA		NA		NA		NA		NA		0.15985714	ND
Aroclor-1248		ND	NA		NA		NA		NA		NA		0.177	ND
Aroclor-1254		ND	NA		NA		NA		NA		NA		0.19414286	ND
Aroclor-1260	0.098		NA		NA		NA		NA		NA		0.21128571	
Total PCBs	NA		0.16		0.21		1.18			ND	1.21		NA	

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NA- Not analyzed
J - Estimated value below method detection limit

Table 1
Soil Sampling Analytical Data
Previously Developed/Disturbed Area
Block 226, Lots 3, 4, 8, and 11
Town of Kearny, Hudson County

Sample ID		S-6-9		S-6-11	
Lab Sample Number		11740-001		11740-003	
Sampling Date		10/24/2006		10/24/2006	
Matrix		Solid		Solid	
Dilution Factor					
Units		mg/kg		mg/kg	
Volatile Organic Compounds					
Acetone		NA		NA	
2-Butanone		NA		NA	
Trichloroethene		NA		NA	
Toluene		NA		NA	
Ethylbenzene		NA		NA	
Xylene		NA		NA	
Benzene		NA		NA	
Tetrachloroethene		NA		NA	
Trichlorfluoromethane		NA		NA	
Styrene		NA		NA	
cis-1,2-Dichloroethene		NA		NA	
Chlorobenzene		NA		NA	
Polychlorinated Biphenyls		NA		NA	
Aroclor-1016			ND		ND
Aroclor-1221			ND		ND
Aroclor-1232			ND		ND
Aroclor-1242			ND		ND
Aroclor-1248			ND		ND
Aroclor-1254			ND		ND
Aroclor-1260			ND		ND
Total PCBs		NA		NA	

ND- The analyte was not detected at the indicated detection limit
NA- Not analyzed
J - Estimated value below method detection limit

Table 2

Comparison of Analytical Data with Ecological Screening Criteria
Upland Successional Woodland Area Soils
Block 226, Lots 3, 4, 8, & 11
Town of Kearny, Hudson County

Constituent	Detection Frequency				Maximum Detected Concentration (mg/kg)	Mean Detected Concentration (mg/kg)	Ecological Screening Value[a] (mg/kg)
BNAs							
Acenaphthene	1	of	1	100%	0.035	0.035	20
Acenaphthylene	1	of	2	50%	0.031	0.0735	682[b]
Anthracene	1	of	2	50%	0.1	0.108	1480[b]
Benzo(a)anthracene	1	of	2	50%	0.31	0.213	5.21[b]
Benzo(a)pyrene	1	of	2	50%	0.31	0.213	1.52b
Benzo(b)fluoranthene	1	of	2	50%	0.54	0.328	59.8[b]
Benzo(g,h,i)perylene	1	of	2	50%	0.078	0.097	119[b]
Benzo(k)fluoranthene	1	of	2	50%	0.19	0.153	148[b]
bis(2-Ethylhexyl)phthalate	1	of	2	50%	2.2	1.158	0.925[b]
Butylbenzylphthalate	1	of	1	100%	0.36	0.36	0.239[b]
Chrysene	1	of	2	50%	0.38	0.248	4.73[b]
Dibenz(a,h)anthracene	1	of	2	50%	43	21.558	18.4[b]
Dimethylphthalate	1	of	1	100%	1.6	1.6	734[b]
2,6-Dinitrotoluene	1	of	1	100%	0.086	0.086	0.0328[b]
Fluoranthene	1	of	2	50%	0.64	0.378	122[b]
Fluorene	1	of	2	50%	0.04	0.078	122[b]
Indeno(1,2,3-cd)pyrene	1	of	2	50%	0.084	0.1	109[b]
Naphthalene	1	of	2	50%	0.015	0.066	0.0994[b]
Phenanthrene	1	of	2	50%	0.45	0.283	45.7[b]
Pyrene	2	of	2	100%	0.68	0.455	78.5[b]
Metals							
Antimony	1	of	1	100%	3.5	3.5	5
Arsenic	2	of	2	100%	5.2	3.79	9.9
Beryllium	1	of	2	50%	0.36	0.32	10
Cadmium	2	of	2	100%	1	0.67	4
Chromium	2	of	2	100%	63.4	54.35	0.4
Chromium VI	1	of	1	100%	4.4	4.40	0.4
Copper	2	of	2	100%	126	82.9	60
Lead	2	of	2	100%	172	117.45	40.5
Mercury	2	of	2	100%	0.434	0.35	0.000051
Nickel	2	of	2	100%	22.6	17.30	30
Selenium	1	of	2	50%	0.99	1.07	0.21
Silver	1	of	2	50%	0.48	0.38	2
Thallium	1	of	2	50%	1.1	0.58	1
Zinc	2	of	2	100%	300	205.00	8.5
PCBs							
Total PCBs	1	of	1	100%	0.87	0.87	0.371

a - Ecological screening values were taken from Preliminary Remediation Goals for Ecological Endpoints.ORNL, August,1997(unless otherwise noted).

b - No ecological screening values for these constituents were available in Preliminary Remediation Goals for Ecological Endpoints. ORNL, August, 1997, so values given are USEPA Region 5 Ecological Screening Levels (ESL). August, 2003.

c - Ecologically based NJ Residential Soil Cleanup Criteria, N.J.A.C. 7:26D.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 2

Comparison of Analytical Data with Ecological Screening Criteria
Previously Developed/Disturbed Area Groundwater
Block 226, Lots 3, 4, 8, 11 & 14
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (ug/l)	Mean Detected Concentration (ug/l)	Ecological Screening Value[a] (ug/l)
VOCs							
Carbon Disulfide	1	of	4	25%	1	0.325	0.92[c]
Acetone	1	of	5	20%	27	8.65	1500[c]
cis-1,2-Dichloroethene	2	of	5	40%	1.4	0.42	590[c]
Chloroform	2	of	5	40%	1.2	0.38	28c
Trichloroethene	2	of	5	40%	5.3	1.51	47[d]
Tetrachloroethene	2	of	5	40%	3.3	0.85	45[d]
Toluene	1	of	5	20%	29	5.88	9.8[c]
Ethylbenzene	1	of	5	20%	1.4	0.36	7.3[c]
1,1-Dichloroethane	1	of	1	100%	0.7	0.70	47[c]
Vinyl Chloride	1	of	1	100%	1	1.00	782[c]
Xylene	1	of	5	20%	110	22.08	13[c]
BNAs							
Acenaphthene	0	of	7	0%	-	-	23[c]
Acenaphthylene	0	of	7	0%	-	-	4840[d]
Anthracene*	1	of	10	10%	0.3	3.3	0.73[c]
Benzo(a)anthracene	0	of	12	0%	-	-	0.025[d]
Benzo(a)pyrene	0	of	10	0%	-	-	0.014[c]
Benzo(b)fluoranthene	0	of	10	0%	-	-	9.07[d]
Benzo(g,h,I)perylene	0	of	10	0%	-	-	7.64[d]
Benzo(k)fluoranthene	0	of	7	0%	-	-	0.38[e]
bis(2-Ethylhexyl)phthalate	7	of	12	58%	11	20.2	0.12[c]
Chrysene	0	of	10	0%	-	-	3.8[e]
Dibenz(a,h)anthracene	0	of	7	0%	-	-	0.0038[e]
Diethylphthalate	10	of	12	83%	700	65.1	0.21[c]
Di-n-butylphthalate	0	of	7	0%	-	-	0.001[c]
Fluoranthene	0	of	12	0%	-	-	1.9[d]
Fluorene	0	of	7	0%	-	-	3.9[c]
Indeno(1,2,3-cd)pyrene	0	of	10	0%	-	-	4.31[d]
Naphthalene	0	of	7	0%	-	-	12[c]
Phenanthrene	0	of	10	0%	-	-	3.6[d]
Pyrene	0	of	12	0%	-	-	0.3[d]
4-Chlorophenyl-phenylether	0	of	7	0%	-	-	NA
N-Nitrosodiphenylamine	0	of	7	0%	-	-	210[c]
Hexachlorobenzene	0	of	7	0%	-	-	0.0003[d]
Butylbenzylphthalate	0	of	7	0%	-	-	19[c]
Di-n-octylphthalate	0	of	10	0%	-	-	30[d]

Notes:

a - Ecological screening values were taken from NJ Surface Water Quality Standards, N.J.A.C. 7:9B7 (unless otherwise noted).

b - National Recommended Water Quality Criteria

c - Preliminary Remediation Goals for Ecological Endpoints.ORNL, August,1997.

d - USEPA Region 5 Ecological Screening Levels (ESLs). August, 2003.

e - NJ Surface Water Quality Standards, N.J.A.C. 7:9B7 human health/carcinogenic criteria.

NA - Not available.

Shaded cells indicate an exceedence of the ecological screening criteria.

* The mean detected concentration value is higher than the maximum detected concentration because of higher method detection limits due to different laboratory analysis dilutions. This situation may therefore artificially inflate the mean concentration above the screening criteria.

Table 2

Comparison of Analytical Data with Ecological Screening Criteria
Wetland Area Groundwater
Block 226, Lots 3, 4, 8, 11 & 14
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (ug/l)	Mean Detected Concentration (ug/l)	Ecological Screening Value[a] (ug/l)
VOCs							
Ethylbenzene	1	of	1	100%	0.6	0.6	14
Toluene	1	of	1	100%	1.4	1.4	253
Xylene	1	of	1	100%	2.9	2.9	27

Notes:

a - National Recommended Water Quality Criteria

b - USEPA Region 5 Ecological Screening Levels (ESL). August, 2003.

c- NJ Surface Water Quality Standards, N.J.A.C. 7:9B

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 2

Comparison of Analytical Data with Ecological Screening Criteria
Wetland Area Surface Water
Block 226, Lots 3, 4, 8, 11 & 14
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (ug/l)	Mean Detected Concentration (ug/l)	Ecological Screening Value[a] (ug/l)
VOCs							
Chloroform	1	of	3	33%	0.479	0.226	140[d]
Tetrachloroethene	1	of	3	33%	1.07	0.507	45[d]
Trichloroethene	1	of	3	33%	2.61	0.987	47[d]
Metals							
Chromium	1	of	3	33%	25.1	11.03	42[d]
Copper	2	of	3	67%	11.6	8.77	9[b]
Lead	3	of	3	100%	19.8	10.21	5.4
Nickel	1	of	3	33%	6.89	3.63	52[b]
Silver	1	of	3	33%	8.42	3.47	3.2[b]
Zinc	3	of	3	100%	119	53.37	120[b]

Notes:

a - Ecological screening values were taken from NJ Surface Water Quality Standards, N.J.A.C. 7:9B7 (unless otherwise noted).

b - National Recommended Water Quality Criteria

c - Preliminary Remediation Goals for Ecological Endpoints.ORNL, August,1997.

d - USEPA Region 5 Ecological Screening Levels (ESLs). August, 2003.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 2

Comparison of Analytical Data with Ecological Screening Criteria
Wetland Area Sediments, Pond 1
Block 226, Lots 3, 4, 8, & 11
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (mg/kg)	Mean Detected Concentration (mg/kg)	Ecological Screening Value[a] (mg/kg)
BNAs							
Acenaphthene	2	of	5	40%	0.046	0.0796	0.016
Acenaphthylene	2	of	5	40%	0.082	0.090	0.044
Anthracene	3	of	5	60%	0.178	0.138	0.220
Benzo(a)anthracene	4	of	5	80%	1.29	0.505	0.320
Benzo(a)pyrene	4	of	5	80%	1.29	0.487	0.370
Benzo(b)fluoranthene	4	of	5	80%	0.948	0.529	4.0[b]
Benzo(g,h,i)perylene	4	of	5	80%	0.783	0.325	0.170
Benzo(k)fluoranthene	4	of	5	80%	1.01	0.368	0.240
Bis(2-ethylhexyl)phthalate	2	of	3	67%	10.4	3.529	2.7[b]
Chrysene	4	of	5	80%	1.37	0.615	0.340
Dibenz(a,h)anthracene	3	of	5	60%	0.43	0.222	0.060
Diethylphthalate	2	of	5	40%	0.87	0.374	0.61[b]
Di-n-butylphthalate	1	of	3	33%	0.248	0.129	240[b]
Fluoranthene	4	of	5	80%	1.91	0.812	0.750
Fluorene	2	of	5	40%	0.3	0.136	0.190
Indeno(1,2,3-cd)pyrene	4	of	5	80%	0.756	0.313	0.200
Naphthalene	2	of	5	40%	0.099	0.090	0.16
Phenanthrene	3	of	5	60%	0.89	0.412	0.560
Pyrene	4	of	5	80%	1.71	0.783	0.490
Metals							
Antimony	0	of	5	0%	-	-	NA
Arsenic	5	of	5	100%	15.7	7.696	6
Beryllium	2	of	5	40%	0.26	0.573	NA
Cadmium	4	of	5	80%	8.18	3.012	0.6
Chromium	5	of	5	100%	202	60.2	26
Copper	5	of	5	100%	367	152.12	16
Lead	5	of	5	100%	379	186.64	31
Mercury	5	of	5	100%	1.39	0.657	0.2
Nickel	5	of	5	100%	57.2	29.584	16
Selenium	0	of	5	0%	-	-	NA
Silver	0	of	5	0%	-	-	1
Thallium	3	of	5	60%	0.48	0.207	NA
Zinc	5	of	5	100%	594	243.32	120
TPHC	5	of	5	100%	2200	570.06	NA
PCBs							
Aroclor-1016	0	of	3	0%	-	-	0.007
Aroclor-1221	0	of	3	0%	-	-	0.12[b]
Aroclor-1232	0	of	3	0%	-	-	0.60[b]
Aroclor-1242	0	of	3	0%	-	-	29[b]
Aroclor-1248	0	of	3	0%	-	-	0.03
Aroclor-1254	2	of	3	67%	1.89	0.933	0.06
Aroclor-1260	1	of	3	33%	0.77	0.289	0.005
Total PCBs	2	of	3	67%	2.66	1.190	0.07

Notes:

a - Ecological screening values were taken from Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of the Environment, 1993 (unless otherwise noted).

b - Ecological screening values referenced from Preliminary Remediation Goals for Ecological Endpoints. ORNL, August,1997.

NA - Ecological screening values not available.

c - Ecologically based NJ Residential Soil Cleanup Criteria, N.J.A.C. 7:26D.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 2

Comparison of Analytical Data with Ecological Screening Criteria
Wetland Area Sediments, Pond 2
Block 226, Lots 3, 4, 8, & 11
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (mg/kg)	Mean Detected Concentration (mg/kg)	Ecological Screening Value[a] (mg/kg)
BNAs							
Acenaphthene	0	of	3	0%	-	-	0.016
Acenaphthylene	0	of	3	0%	-	-	0.044
Anthracene	0	of	3	0%	-	-	0.220
Benzo(a)anthracene	3	of	3	100%	1.11	0.706	0.320
Benzo(a)pyrene	3	of	3	100%	1.19	1.025	0.370
Benzo(b)fluoranthene	3	of	3	100%	1.08	0.864	4.0[b]
Benzo(g,h,i)perylene	3	of	3	100%	0.912	0.746	0.170
Benzo(k)fluoranthene	3	of	3	100%	1.03	0.830	0.240
Bis(2-ethylhexyl)phthalate	3	of	3	100%	44.7	34.433	2.7[b]
Chrysene	3	of	3	100%	1.2	0.928	0.340
Dibenz(a,h)anthracene	1	of	3	33%	0.482	0.299	0.060
Diethylphthalate	3	of	3	100%	6.52	3.878	0.61[b]
Di-n-butylphthalate	3	of	3	100%	6.86	3.893	240[b]
Fluoranthene	3	of	3	100%	1.58	1.009	0.750
Fluorene	0	of	3	0%	-	-	0.190
Indeno(1,2,3-cd)pyrene	3	of	3	100%	0.825	0.622	0.200
Naphthalene	0	of	3	0%	-	-	0.16
Phenanthrene	3	of	3	100%	0.537	0.386	0.560
Pyrene	3	of	3	100%	1.43	1.327	0.490
Metals							
Antimony	0	of	3	0%	-	-	NA
Arsenic	3	of	3	100%	15.5	11.440	6
Beryllium	0	of	3	0%	-	-	NA
Cadmium	3	of	3	100%	17.5	15.833	0.6
Chromium	3	of	3	100%	94.6	75.933	26
Copper	3	of	3	100%	984	588.833	16
Lead	3	of	3	100%	2210	1966.667	31
Mercury	3	of	3	100%	2.15	1.983	0.2
Nickel	3	of	3	100%	214	188.667	16
Selenium	0	of	3	0%	-	-	NA
Silver	3	of	3	100%	5.42	4.637	1
Thallium	1	of	3	33%	0.32	0.175	NA
Zinc	3	of	3	100%	4500	3766.667	120
TPHC	3	of	3	100%	21800	14036.000	NA
PCBs							
Aroclor-1016	0	of	3	0%	-	-	0.007
Aroclor-1221	0	of	3	0%	-	-	0.12[b]
Aroclor-1232	0	of	3	0%	-	-	0.60[b]
Aroclor-1242	0	of	3	0%	-	-	29[b]
Aroclor-1248	0	of	3	0%	-	-	0.03
Aroclor-1254	3	of	3	100%	0.782	0.574	0.06
Aroclor-1260	1	of	3	33%	0.324	0.142	0.005
Total PCBs	3	of	3	100%	0.86	0.682	0.07

Notes:

a - Ecological screening values were taken from Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of the Environment, 1993 (unless otherwise noted).

b - Ecological screening values referenced from Preliminary Remediation Goals for Ecological Endpoints. ORNL, August,1997.

NA - Ecological screening values not available.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 3

Comparison of Analytical Data with Ecological Screening Criteria
Kearny Marsh Sediment Station W7
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (mg/kg)	Mean Detected Concentration (mg/kg)	Ecological Screening Value[a] (mg/kg)
BNAs							
Benzo(a)anthracene	1	of	4	25%	0.781	0.781	0.320
Benzo(a)pyrene	1	of	4	25%	0.797	0.797	0.370
Benzo(b)fluoranthene	1	of	4	25%	1.07	1.07	4.0[b]
Benzo(g,h,i)perylene	0	of	0	-	NA	NA	0.170
Benzo(k)fluoranthene	0	of	0	-	NA	NA	0.240
Bis(2-ethylhexyl)phthalate	4	of	4	100%	35.6	10.63325	2.7[b]
Butylbenzylphthalate	1	of	4	25%	0.9	0.9	1.970[c]
Chrysene	1	of	4	25%	0.99	0.99	0.340
Dibenz(a,h)anthracene	0	of	0	-	NA	NA	0.060
Di-n-butylphthalate	0	of	4	0%	ND	ND	240[b]
Di-n-octylphthalate	2	of	4	50%	4.45	2.82	40.6[c]
Fluoranthene	1	of	4	25%	1.16	1.16	0.750
Indeno(1,2,3-cd)pyrene	0	of	0	-	NA	NA	0.200
Phenanthrene	0	of	0	-	NA	NA	0.560
Pyrene	1	of	4	25%	1.62	1.62	0.490
Metals							
Arsenic	4	of	4	100%	31.7	14.793	6
Beryllium	0	of	0	-	NA	NA	NA
Cadmium	4	of	4	100%	12.5	7.085	0.6
Chromium	4	of	4	100%	294	165.125	26
Copper	4	of	4	100%	596	344.250	16
Lead	4	of	4	100%	1260	722.500	31
Mercury	4	of	4	100%	7.07	4.430	0.2
Nickel	4	of	4	100%	120	64.000	16
Selenium	1	of	4	25%	5.28	5.280	NA
Silver	3	of	4	75%	2.7	1.963	1
Thallium	0	of	0	-	NA	NA	NA
Zinc	4	of	4	100%	1600	922.000	120
VOCs							
Methylene chloride	3	of	4	75%	0.067	0.0485	18[b]
Total xylenes	2	of	4	50%	0.0201	0.01214	0.12
PCBs							
Total PCBs	0	of	4	0%	ND	ND	0.07

Notes:

Samples were collected from the following 4 intervals at each sampling station: 0-0.5, 0.5-1, 1-1.5, & 1.5-2 feet below sediment surface. These discrete sampling intervals were analyzed and averaged for each sampling station.

a - Ecological screening values were taken from Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of the Environment, 1993 (unless otherwise noted).

b - Ecological screening values referenced from Preliminary Remediation Goals for Ecological Endpoints. ORNL, August,1997.

c - USEPA Region 5 Ecological Screening Levels (ESLs). August, 2003.

NA - Ecological screening values not available, or Not Analyzed when used in max or avg. columns.

ND - Constituent not detected, and no method detection limits available.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 3

Comparison of Analytical Data with Ecological Screening Criteria
Kearny Marsh Sediment Stations W7, W8, & W9
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (mg/kg)	Mean Detected Concentration (mg/kg)	Ecological Screening Value[a] (mg/kg)
BNAs							
Benzo(a)anthracene	3	of	12	25%	1.37	0.850	0.320
Benzo(a)pyrene	3	of	12	25%	2.24	1.198	0.370
Benzo(b)fluoranthene	3	of	12	25%	2.25	1.302	4.0[b]
Benzo(g,h,i)perylene	2	of	8	25%	1.54	1.020	0.170
Benzo(k)fluoranthene	2	of	8	25%	0.986	0.621	0.240
Bis(2-ethylhexyl)phthalate	6	of	12	50%	35.6	8.061	2.7[b]
Butylbenzylphthalate	1	of	4	25%	0.9	0.900	1.970[c]
Chrysene	3	of	12	25%	1.93	1.088	0.340
Dibenz(a,h)anthracene	1	of	8	13%	0.476	0.476	0.060
Di-n-butylphthalate	2	of	12	17%	0.751	0.512	240[b]
Di-n-octylphthalate	2	of	4	50%	4.45	2.820	40.6[c]
Fluoranthene	3	of	12	25%	1.97	1.178	0.750
Indeno(1,2,3-cd)pyrene	2	of	8	25%	1.22	0.814	0.200
Phenanthrene	1	of	8	13%	1.12	1.120	0.560
Pyrene	3	of	12	25%	2.42	1.468	0.490
Metals							
Arsenic	12	of	12	100%	42.5	13.195	6
Beryllium	1	of	8	13%	0.873	0.873	NA
Cadmium	10	of	12	83%	28.2	8.178	0.6
Chromium	12	of	12	100%	5950	682.142	26
Copper	12	of	12	100%	596	223.408	16
Lead	12	of	12	100%	1260	514.443	31
Mercury	12	of	12	100%	158	43.193	0.2
Nickel	12	of	12	100%	120	47.987	16
Selenium	1	of	4	25%	5.28	5.280	NA
Silver	6	of	12	50%	2.7	1.734	1
Thallium	1	of	8	13%	0.421	0.421	NA
Zinc	12	of	12	100%	2090	736.663	120
VOCs							
Methylene chloride	9	of	12	75%	205	22.80923333	18[b]
Total xylenes	3	of	12	25%	0.0201	0.01	0.12
PCBs							
Total PCBs	0	of	12	0%	ND	ND	0.07

Notes:

Samples were collected from the following 4 intervals at each sampling station: 0-0.5, 0.5-1, 1-1.5, & 1.5-2 feet below sediment surface. These discrete sampling intervals were analyzed and averaged for each sampling station.

a - Ecological screening values were taken from Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of the Environment, 1993 (unless otherwise noted).

b - Ecological screening values referenced from Preliminary Remediation Goals for Ecological Endpoints. ORNL, August,1997.

c - USEPA Region 5 Ecological Screening Levels (ESLs). August, 2003.

NA - Ecological screening values not available.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 3

Comparison of Analytical Data with Ecological Screening Criteria
Kearny Marsh Surface Water Station W7
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (ug/l)	Mean Detected Concentration (ug/l)	Ecological Screening Value[a] (ug/l)
VOCs							
Chloroform	0	of	1	0%	-	-	28[c]
Toluene	0	of	1	0%	-	-	9.8[c]
BNAs							
Diethylphthalate	0	of	1	0%	-	-	110[d]
bis(2-ethylhexyl)phthalate	0	of	1	0%	-	-	0.12[c]
PCBs							
Total PCBs	0	of	1	0%	-	-	0.014
Pesticides							
4,4-DDD	0	of	1	0%	-	-	0.000041[c]
Metals							
Cadmium	0	of	1	0%	-	-	0.25[b]
Lead	1	of	1	100%	11.6	11.6	5.4
Silver	0	of	1	0%	-	-	3.2[b]
Zinc	1	of	1	100%	47	47	120[b]

Notes:

a - Ecological screening values were taken from NJ Surface Water Quality Standards, N.J.A.C. 7:9B7 (unless otherwise noted).

b - National Recommended Water Quality Criteria

c - Preliminary Remediation Goals for Ecological Endpoints.ORNL, August,1997.

d - USEPA Region 5 Ecological Screening Levels (ESLs). August, 2003.

Shaded cells indicate an exceedence of the ecological screening criteria.

Table 3

Comparison of Analytical Data with Ecological Screening Criteria
Kearny Marsh Surface Water Stations W7, W8, & W9
Town of Kearny, Hudson County, New Jersey

Constituent	Detection Frequency				Maximum Detected Concentration (ug/l)	Mean Detected Concentration (ug/l)	Ecological Screening Value[a] (ug/l)
VOCs							
Chloroform	0	of	3	0%	-	-	28[c]
Toluene	0	of	3	0%	-	-	9.8[c]
BNAs							
Di-n- butyl phthalate	1	of	1	100%	40	40	1[c]
Diethylphthalate	0	of	3	0%	-	-	110[d]
bis(2-ethylhexyl)phthalate	0	of	3	0%	-	-	0.12[c]
PCBs							
Total PCBs	0	of	3	0%	-	-	0.014
Pesticides							
4,4-DDD	0	of	3	0%	-	-	0.000041[c]
Metals							
Cadmium	0	of	3	0%	-	-	0.25[b]
Lead	3	of	3	100%	11.6	5.6	5.4
Silver	0	of	3	0%	-	-	3.2[b]
Zinc	3	of	3	100%	47	41.33	120[b]

Notes:

a - Ecological screening values were taken from NJ Surface Water Quality Standards, N.J.A.C. 7:9B7 (unless otherwise noted).

b - National Recommended Water Quality Criteria

c - Preliminary Remediation Goals for Ecological Endpoints.ORNL, August,1997.

d - USEPA Region 5 Ecological Screening Levels (ESLs). August, 2003.

Shaded cells indicate an exceedence of the ecological screening criteria.

ATTACHMENT C

Kearny Marsh Sediment and Water Sampling Report

EcolSciences, Inc.

Environmental Management & Regulatory Compliance

SEDIMENT AND WATER SAMPLING REPORT

KEARNY MARSH
KEARNY, NEW JERSEY

Prepared For:

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P.O. Box 1067
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Prepared By:

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River Drive Center 1
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22 June 1999
1567701

Langan
Engineering and Environmental Services

1.0 INTRODUCTION

Langan Engineering and Environmental Services, Inc. (Langan) has completed sediment and water sampling at the Kearny Marsh site located in Kearny, New Jersey (Figure 1). The sampling was conducted in accordance with the sampling plan provided to Langan (Appendix A), and developed by the Hackensack Meadowlands Development Commission (HMDC). Langan personnel completed surface water sampling on 7 and 8 April 1999. Core sediment sampling was completed on 29 April 1999 by Aqua Survey, Inc. of Flemington, New Jersey under the supervision of Langan personnel. Surface sediment sampling was completed on 26 May 1999 by Langan personnel.

This report details sediment and water sampling methodologies and provides a summary of analytical results.

2.0 SITE DESCRIPTION

The Kearny Marsh site encompasses approximately three hundred acres of impounded fresh water marsh (Figure 2). The site is bounded by the New Jersey Turnpike to the east, the NJ Transit Erie Lackawanna line to the north, and abandoned Conrail Erie Lackawanna lines to the south and west. Water depth in the Marsh ranges from approximately 2.5 to 4 feet. Dense *Phragmites* growth is present at various locations throughout the site.

3.0 SAMPLING METHODOLOGY

The following sections describe the sampling methodologies for collection of the water and sediment samples.

3.1 Surface Water Sampling

Surface water samples were collected at 22 locations (W-1 to W-22) in the marsh on 7 and 8 April 1999. The sample locations are shown in Figure 2. Each location was accessed using a 12-foot boat and samples were collected with a grab sampler and transferred directly into the laboratory provided bottles. The sampling device was decontaminated between samples using successive rinses of a laboratory grade phosphate-free soap solution, tap water and deionized water. Field parameter measurements were obtained at each sampling location using portable meters. The

core barrel was lined with dedicated 10-millimeter polyethylene liners. Once the core sample was retrieved from the water, the liner was removed from the core barrel, cut open and a discrete sample was transferred into the laboratory provided bottles from depths of 12, 24, and 36 inches below surface. The soil core was described using the Unified Soil Classification System (USCS). The sediment samples were analyzed for PP+40, TPH, TOC, pH and particle size. Sample locations are shown on Figure 2.

4.0 RESULTS

4.1 Surface Water

According to the NJDEP's Surface Water Quality Standards (SWQS; N.J.A.C. 7:9B), the site is classified as FW2. FW2 refers to all nontidal and tidal waters generally having salinity, due to natural sources, of less than or equal to 3.5 parts per thousand (ppt) at mean high tide. This is a general surface water classification applied to those fresh waters that are not designated as FW1 (maintained in their natural state of quality and not subjected to any man-made wastewater discharges or increases in runoff from anthropogenic activities) or Pinelands Waters.

Surface water sampling results are summarized in Table 1. Field parameter measurements and other field data are summarized in Table 2. The complete laboratory analytical package is provided in Appendix B. The water analytical data demonstrates that fecal coliform exceeded the SWQS at location W-9. In addition, the SWQS for lead was exceeded at all locations. The lead results ranged from 7.26 ug/l at location W-17 to 20.6 ug/l at location W-19. The average lead concentration detected was 10.52 ug/l.

The SWQS for 4-4'-DDD was exceeded at location W-22, which had a concentration of 0.0353 ug/l. Pesticides were not detected at any other sampling location. Total suspended solids exceeded SWQS at sampling locations W-19 and W-20, with concentrations of 49 mg/l and 58 mg/l respectively. The chloride SWQS has three categories including: i) a chronic aquatic life protection criteria, ii) an organoleptic effect-based criteria, and iii) an acute aquatic life protection criteria. The criteria in (i) and (ii) were exceeded at all sampling locations. The total chloride concentration ranged from 400 mg/l at sampling location W-9 to 740 mg/l at sampling location W-21. The average chloride concentration detected was 637 mg/l.

Trace concentrations of volatile organic compounds were detected at sampling locations W-9, W-15, W-16, and W-18. Trace concentrations of semivolatile

- arsenic at W-2B, W-2C, W-4A, W-5C, W-7(A,B,&C), W-9A, and W-13A;
- cadmium at W-4A, W-7(A,B,&C), W-8B, W-8C, W-9A, and W-9B;
- chromium at W-2B, W-7(A,B,&C), W-8B, W-8C, and W-9(A,B,&C);
- copper W-2(A,B,&C), W-3C, W-4(A,B,&C), W-5A, W-5C, W-6A, W-7(A,B,&C), W-8B, W-8C, W-9(A,B,&C), W-13A, DUPE1, W-13B, W-15A, W-15C, W-21B and W-21C;
- lead at W-2B, W-2C, W-4A, W-5A, W-7(A,B,&C), W-8B, W-8C, W-9(A,B,&C), and W-15A;
- mercury at W-2B, W-2C, W-4A, W-7(A,B,&C), W-8B, W-8C, and W-9(A,B,&C);
- nickel at W-2C, W-7(A,B,&C), W-8B, W-9A, and W-9B; and
- zinc at W-2B, W-2C, W-6A, W-7(A,B,&C), W-8B, and W-9(A,B,&C).

5.0 CONCLUSIONS

Analytical results for water and sediment sampling reveal that contaminants including lead and 4,4'-DDD (exceeded SWQS at only one location) are present in surface water, and low levels of base neutral compounds and pesticides, and elevated concentrations of metals (As, Cd, Cr, Cu, Pb, Hg, Ni, and Zn) are present in sediment within the Kearny Marsh. Potential sources of these contaminants observed during completion of sampling include landfill runoff, stormwater runoff via pipe flow and overland flow, and discharges from adjoining automotive scrap yards and industrial facilities.

For the purposes of this investigation and as requested by HMDC, all sediment results were compared to Ontario Sediment Quality Criteria. The criteria were not adjusted to account for elevated total organic carbon (TOC) values measured at all sampling locations. Site specific guidelines which address issues such as contaminant leachability and mobility, potential for direct contact and/or ingestion by organisms, and background concentrations of metals must be developed to accurately assess the impact of detected contamination. Such work is beyond the scope of this investigation.

TABLE 3
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
APRIL 1999 SAMPLING EVENT
KEARNY MARSH
KEARNY, NEW JERSEY
PROJECT 1567701

Sample ID				W1	W2	W2A	W2B	W2C	W3A	W3B	W3C	W4	W4A	W4B	W4C
Laggar Sample Number				081	080	049	050	051	052	053	054	076	046	047	048
Lab Sample Number	ONTARIO AQUATIC SEDIMENT QUALITY			2964-015	2964-014	2421-019	2421-020	2421-021	2421-022	2421-023	2421-024	2964-012	2421-016	2421-017	2421-018
Depth (feet)				0 - 0.5	0 - 0.5	0.5 - 1	1.5 - 2	2.5 - 3	0.5 - 1	1.5 - 2	2.5 - 3	0 - 0.5	0.5 - 1	1.5 - 2	2.5 - 3
Sampling Date	LEL	SEL	Units	5/26/99	5/26/99	4/29/99	4/29/99	4/29/99	4/29/99	4/29/99	4/29/99	5/26/99	4/29/99	4/29/99	4/29/99
VOLATILE ORGANIC COMPOUNDS															
Methylene Chloride	---	---	mg/kg	ND	ND	0.01038	0.03228	0.0218	0.03458	0.02318	0.02668	ND	0.01598	0.02488	0.52338
Total Xylenes	---	---	mg/kg	0.0286J	ND	ND	0.00241J	ND	ND	ND	ND	ND	ND	ND	ND
VOLATILE ORGANICS TICs															
Unknown alkane	---	---	mg/kg	0.1618	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown aliphatic	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.0135	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS															
Di-n-butyl phthalate	---	---	mg/kg	ND	0.311J	ND	ND	ND	ND	ND	ND	1.27J	ND	ND	ND
Fluoranthene	0.75	1,670	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.49	850	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[a]anthracene	0.52	1,480	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	0.34	660	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[b]fluoranthene	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[k]fluoranthene	0.24	1,340	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[a]pyrene	0.37	1,440	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene	0.2	320	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-octylphthalate	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[g,h,i]perylene	0.17	320	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANICS TICs															
Unknown aromatic	---	---	mg/kg	13.3	26.56	ND	23.52	18.35	16.05	2.62	ND	ND	ND	12.56	3.41
Unknown	---	---	mg/kg	ND		ND	5.95	5.66	6.31	60.62	ND	13	ND	227.09	24.31
Unknown alkene	---	---	mg/kg	237.28	7.34	ND	ND	8.14	51.8	ND	ND	179.94	ND	0.71	ND
Vitamin E	---	---	mg/kg	ND	ND	ND	ND	ND	2.31	ND	ND	ND	ND	ND	ND
TOTAL PCBs	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PESTICIDES															
4,4'-DDD	0.008	8	mg/kg	0.0128	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METALS															
Antimony	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.55	ND	ND
Arsenic	6	33	mg/kg	58.4	8.74	6.747	9.58	16.2	3.49	0.804	2.83	34.2	8.07	5.6	4.02
Cadmium	0.6	10	mg/kg	6.1	ND	ND	ND	2.18	ND	ND	ND	ND	0.515	ND	ND
Chromium	26	110	mg/kg	47.3	35	12.4	28.3	13.4	2.46	1.46	8.38	28.5	28.4	3.28	3.18
Copper	16	110	mg/kg	61.6	31.6	16.3	28.7	55.3	15.8	15.2	20.8	32.2	61.1	24.8	25.3
Lead	31	250	mg/kg	95.7	72.2	8.26	112	32.4	8.63	ND	5.31	107	168	16.7	8.56
Mercury	0.2	2	mg/kg	0.885	0.258	0.024	0.803	0.471	0.058	0.039	0.049	0.329	0.255	0.072	ND
Nickel	16	75	mg/kg	38.1	9.65	ND	ND	24.9	5.22	3.44	6.31	22.6	13.4	ND	ND
Selenium	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Silver	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	120	820	mg/kg	515	127	18.4	301	423	67.6	11.3	8.46	244	117	47	34.8
WET CHEMISTRY															
Cyanide	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	0.811	ND	ND	ND
Total Petroleum Hydrocarbons	---	---	mg/kg	650	207	52.6	167	483	167	205	118	380	66.7	337	1120
Corrosivity as pH	---	---	S.U.	7.52	7.52	7.33	7.28	7.11	7.4	7.21	7.09	7.49	7.23	7.66	8.91
Total Organic Carbons	---	---	mg/kg	53000	25000	15000	73000	59000	54000	37000	44000	45000	30000	50000	56000

Notes: Lowest Effect Levels (LEL) do not require any further calculations, however, Severe Effect Levels (SEL) must be multiplied by individual TOC samples/location
ND indicates that the sample was analyzed for the compound, but the compound was not detected
J indicates that the concentration was detected at a value below the minimum detection limits
B indicates the compound was detected in the blank and the sample

TABLE 3 CONTINUED
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
APRIL 1999 SAMPLING EVENT
KEARNY MARSH
KEARNY, NEW JERSEY
PROJECT 1567701

Sample ID				W13	W13A	DUPE 1	W13B	W13C	DUPE 2	W14	W15	W15A	W15B	W15C	W16
Langan Sample Number				087	058	061	059	060	062	083	076	055	056	057	085
Lab Sample Number	ONTARIO AQUATIC			2964-021	2421-028	2421-031	2421-029	2421-030	2421-032	2964-017	2964-010	2421-025	2421-026	2421-027	2964-020
Depth (feet)	SEDIMENT QUALITY			0 - 0.5"	0.5 - 1	0.5 - 1	1.5 - 2	2.5 - 3	2.5 - 3	0 - 0.5"	0 - 0.5"	0.5 - 1	1.5 - 2	2.5 - 3	0 - 0.5"
Sampling Date	LEL	SEL	Units	5/26/99	4/29/99	4/29/99	4/29/99	4/29/99	4/29/99	5/26/99	5/26/99	4/29/99	4/29/99	4/29/99	5/26/99
VOLATILE ORGANIC COMPOUNDS															
Methylene Chloride	---	---	mg/kg	ND	0.0724B	0.0170B	0.0312B	0.0181B	0.0159B	ND	ND	0.0221B	0.0409B	0.0244B	ND
VOLATILE ORGANICS TICs															
Unknown alkane	---	---	mg/kg	0.182	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS															
Di-n-butyl phthalate	---	---	mg/kg	0.486J	ND	ND	ND	ND	ND	0.631J	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANICS TICs															
Unknown	---	---	mg/kg	ND	3.73	5.74	116.6	4.72	2.64	ND	ND	ND	ND	2.26	ND
Unknown alkane	---	---	mg/kg	4.77	5.46	ND	1.37	ND	ND	41.22	192	ND	7.19	ND	ND
Unknown aromatic	---	---	mg/kg	8.34	2.22	ND	3.23	ND	ND	17.77	104.75	ND	ND	ND	ND
TOTAL PCBs	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PESTICIDES															
4,4'-DDD	0.008	8	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0108
METALS															
Arsenic	8	33	mg/kg	34.4	7.39	3.91	4.47	2.23	2.35	53.2	48.2	6.41	3.17	3.03	50.2
Cadmium	0.6	10	mg/kg	ND	ND	ND	ND	ND	ND	ND	3.3	ND	ND	ND	ND
Chromium	26	110	mg/kg	66.7	8.28	3.01	5.36	3.6	4.01	59.6	44.6	7.09	7.3	7.04	13
Copper	16	110	mg/kg	66.4	20	16.9	20.3	12.9	15.1	109	86.9	30.4	11.1	16.8	10.6
Lead	31	250	mg/kg	251	20	8.69	11.5	11.9	13.2	305	295	42.5	13.1	25.9	81.2
Mercury	0.2	2	mg/kg	0.391	0.064	ND	ND	0.033	0.04	0.404	0.962	0.089	0.046	0.035	0.36
Nickel	16	75	mg/kg	20.8	10.9	6.14	7.42	4.27	4.44	44.8	32.4	10.6	12.4	8.65	17.5
Zinc	120	820	mg/kg	163	83.7	65.4	97.6	15	16.8	410	433	72.5	37.2	30.6	244
WET CHEMISTRY															
Cyanide	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	---	---	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbons	---	---	mg/kg	190	205	75.5	118	316	56.2	532	121	316	483	167	507
Corrosivity as pH	---	---	S.U	7.38	7.21	6.93	7.09	7.02	6.78	7.28	6.66	7.02	7.11	7.4	7.59
Total Organic Carbons	---	---	mg/kg	48000	46000	50000	48000	30000	37000	52000	48000	26000	40000	46000	51000

Notes: Lowest Effect Levels (LEL) do not require any further calculations, however, Severe Effect Levels (SEL) must be multiplied by individual TOC sample/location
ND indicates that the sample was analyzed for the compound, but the compound was not detected
J indicates that the concentration was detected at a value below the minimum detection limits
B indicates the compound was detected in the blank and the sample

TABLE 1
SUMMARY OF WATER ANALYTICAL RESULTS: 7 AND 8 APRIL 1999
KEARNY MARSH - KEARNY, NJ
PROJECT 1567701

Sample ID			W1	W2	W3	W4	W5	W6	W7	W8	W9	DUPE	W10	W11
Langan Sample Number			005	004	010	009	008	007	003	002	001	030	018	017
Lab Sample Number	NJDEP		1866-005	1866-004	1866-005	1866-004	1866-003	1866-002	1866-003	1866-002	1866-001	1918-012	1897-001	1897-002
Sampling Date	SWQS	Units	4/7/99	4/7/99	4/7/99	4/7/99	4/7/99	4/7/99	4/7/99	4/7/99	4/7/99	4/8/99	4/8/99	4/8/99
VOLATILE ORGANIC COMPOUNDS														
Toluene	7,440 (h)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	5.67 (hc)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	0.441	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS														
Di-n-butyl phthalate	3,530 (h)	ug/l	ND	ND	1.62 J	1.48 J	1.95 J	2.07 J	NA	40	NA	ND	1.55 J	ND
Diethylphthalate	21,200 (h)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	1.76 (hc)	ug/l	ND	ND	ND	ND	ND	ND	NA	ND	NA	ND	ND	ND
SEMIVOLATILE ORGANICS TICs														
Eicosane	---	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexacosane	---	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptacosane	---	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Octacosane	---	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Unknown alkanes	---	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL PCBS	---	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PESTICIDES														
4,4'-DDD	0.000832 (hc)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METALS														
Cadmium	10 (h)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lead	5 (h)	ug/l	7.73	9.45	8.14	7.52	8.18	14.5	11.5	9.47	7.33	8.18	8.8	10.2
Silver	164 (h)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	---	ug/l	ND	ND	ND	ND	ND	ND	47	30	47	24	30	ND
WET CHEMISTRY														
Cyanide	5.2 (c)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	22 (a)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	766 (h)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	20,900 (h)	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Petroleum Hydrocarbons	---	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Corrosivity as pH	6.5-8.5	S.U.	7.84	7.76	7.93	7.88	7.98	7.97	7.8	7.77	7.53	7.8	7.79	7.81
Total Suspended Solids	40	mg/l	17	15	14	16	11	21	15	17	18	25	16	20
Chemical Oxygen Demand	---	mg/l	65	59	55	50	52	61	59	50	52	37	55	60
Biochemical Oxygen Demand	---	mg/l	2.74	0.92	20.3	12.5	9.95	12.3	2.14	8.98	5.89	11.5	8.75	12.1
Total Organic Carbon	---	mg/l	16.05	15.25	14.75	14.67	14.93	15.16	14.8	14.1	12.96	11.27	15.13	15.05
Total Kjeldahl Nitrogen - TKN	---	mg/l	2.4	2	1	1.2	0.9	1.1	1.3	1.3	1.7	1.8	1.3	1.4
Total Phosphate	---	mg/l	0.11	0.11	0.13	0.11	0.11	0.12	0.11	0.13	0.16	0.16	0.11	0.19
Chloride	230,000 (c)	ug/l	610000	600000	660000	670000	670000	620000	570000	500000	400000	460000	670000	670000
	250,000 (o)	ug/l	610000	600000	660000	670000	670000	620000	570000	500000	400000	460000	670000	670000
	860,000 (a)	ug/l	610000	600000	660000	670000	670000	620000	570000	500000	400000	460000	670000	670000
Sulfate	250	mg/l	49	49	55	52	64	51	49	44	39	41	55	52
Color	---	Pt. Co.	50	50	50	50	45	45	50	40	35	35	50	50
Surfactants	---	mg/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Turbidity	50	N.T.U.	11	14	9	9	8.5	10	9	11	12	11	8	11
Fecal Coliform	200	MPN/100 ml	30	50	13	11	4	11	50	30	3000	NA	8	7

TABLE 1
SUMMARY OF WATER ANALYTICAL RESULTS: 7 AND 8 APRIL 1999
KEARNY MARSH - KEARNY, NJ
PROJECT 1567701

Sample ID			FB	TB	TB
Langan Sample Number			006	011	029
Lab Sample Number	NJDEP		1886-001	1886-008	1918-011
Sampling Date	SWQS	Units	4/7/99	4/7/99	4/7/99
VOLATILE ORGANIC COMPOUNDS	---	ug/l	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS					
Di-n-butyl phthalate	3,500 (h)	ug/l	1.4 J	5.3	ND
bis(2-Ethylhexyl)phthalate	1.75 (hc)	ug/l	5.08	ND	ND
SEMIVOLATILE ORGANICS TICs	---	ug/l	ND	ND	ND
TOTAL PCBS	---	ug/l	ND	ND	ND
TOTAL PESTICIDES	---	ug/l	ND	ND	ND
TOTAL METALS	---	ug/l	ND	ND	ND
WET CHEMISTRY					
Cyanide	5.2 (c)	ug/l	ND	NA	NA
	22 (a)	ug/l	ND	NA	NA
	750 (h)	ug/l	ND	NA	NA
Phenol	20,900 (h)	ug/l	ND	NA	NA
Total Petroleum Hydrocarbons	---	mg/l	ND	NA	NA
Corrosivity as pH	6.5-8.5	S.U	NA	NA	NA
Total Suspended Solids	40	mg/l	NA	NA	NA
Chemical Oxygen Demand	---	mg/l	NA	NA	NA
Biochemical Oxygen Demand	---	mg/l	NA	NA	NA
Total Organic Carbon	---	mg/l	NA	NA	NA
Total Kjeldahl Nitrogen - TKN	---	mg/l	NA	NA	NA
Total Phosphate as P	---	mg/l	NA	NA	NA
Chloride	250,000 (c)	ug/l	NA	NA	NA
	250,000 (ol)	ug/l	NA	NA	NA
	860,000 (a)	ug/l	NA	NA	NA
Sulfate	250	mg/l	NA	NA	NA
Color	---	Pt. Co.	NA	NA	NA
Surfactants	---	mg/l	NA	NA	NA
Turbidity	50	N.T.U.	NA	NA	NA
Fecal Coliform	200	MPN/100 ml	NA	NA	NA

Notes: ' Indicates holding times were exceeded by laboratory
NA indicates that the sample was not analyzed for the compound
ND indicates that the sample was analyzed for the compound, but the compound was not detected
J indicates that the concentration was detected at a value below the minimum detection limits
(a) represents acute aquatic life protection criteria as a one-hour average
(ol) represents organoleptic effect-based criteria and are maximum concentrations
(c) represents chronic aquatic life protection criteria as a four-day average
(h) represents noncarcinogenic effect-based human health criteria as a 30-day average
(hc) represents carcinogenic effect-based human health criteria as a 70-year average
Duplicate sample was taken at WD

bold - boxed values indicate exceedance of SWQS

TABLE 2 (Continued)
Field Parameter Measurements and Observations
Water Sampling 7 & 8 April 1999 / Sediment Sampling 29 April 1999
Kearny Marsh - Kearny, NJ

Sample Location	Field Parameters	Loc Lat./Long.	Core Rec (ft)	Core Int. (ft)	Sediment Description	USCS Symbol
W-5	pH (std. Units): 8.13 Temp. (deg. C): 16.20 Spec. cond. (uS): 3360 ORP (mV): 117.10 Sal. (ppt): 1.70 DO (ppm): 14.30 Water depth (ft): ---	40° 45' 36.67" 74° 07' 52.33"	4 of 6	0-3 3-4	Brown PEAT, some clay and silt Brown organic CLAY/PEAT	Pt/CL Pt/CL
W-6	pH (std. Units): 8.07 Temp. (deg. C): 15.70 Spec. cond. (uS): 3470 ORP (mV): 116.80 Sal. (ppt): 1.80 DO (ppm): 14.00 Water depth (ft): 4.00	40° 45' 34.11" 74° 07' 55.55"	5.5 of 6	0-4.5 4.5-5.5	Brown PEAT Gray stiff CLAY, trace fine sand, trace silt	Pt CL
W-7	pH (std. Units): 7.50 Temp. (deg. C): 12.70 Spec. cond. (uS): 2370 ORP (mV): 117.20 Sal. (ppt): 1.20 DO (ppm): 10.00 Water depth (ft): 3.50	40° 45' 42.45" 74° 08' 06.92"	3 of 6	0-3	Black organic CLAY and SILT, with leaves, roots, branches	OH
W-8	pH (std. Units): 7.65 Temp. (deg. C): 12.80 Spec. cond. (uS): 2008 ORP (mV): 114.80 Sal. (ppt): 1.00 DO (ppm): 13.00 Water depth (ft): 2.50	40° 45' 48.10" 74° 08' 03.86"	6 of 6	0-4 4-6	Brown PEAT Gray stiff CLAY, trace fine sand, trace silt	Pt CL

TABLE 2 (Continued)
Field Parameter Measurements and Observations
Water Sampling 7 & 8 April 1999 / Sediment Sampling 29 April 1999
Kearny Marsh - Kearny, NJ

Sample Location	Field Parameters	Loc Lat./Long.	Core Rec (ft)	Core Int. (ft)	Sediment Description	USCS Symbol
W-13	pH (std. Units): 8.13 Temp. (deg. C): 15.10 Spec. cond. (uS): 801.00 ORP (mV): 119.30 Sal. (ppt): 0.40 DO (ppm): 10.20 Water depth (ft): 3.00	40° 45' 36.13" 74° 07' 44.49"	0 of 0	0	No core sample collected	---
W-14	pH (std. Units): 8.09 Temp. (deg. C): 15.60 Spec. cond. (uS): 1023 ORP (mV): 118.90 Sal. (ppt): 0.50 DO (ppm): 11.00 Water depth (ft): ---	40° 45' 48.15" 74° 07' 24.96"	0 of 0	0	No core sample collected	---
W-15	pH (std. Units): 8.25 Temp. (deg. C): 17.50 Spec. cond. (uS): 880.00 ORP (mV): 116.10 Sal. (ppt): 0.40 DO (ppm): 14.00 Water depth (ft): 3.60	40° 45' 44.96" 74° 07' 26.06"	4 of 6	0-4	Brown PEAT	Pt
W-16	pH (std. Units): 8.18 Temp. (deg. C): 16.70 Spec. cond. (uS): 851.00 ORP (mV): 112.90 Sal. (ppt): 0.40 DO (ppm): 18.00 Water depth (ft): ---	40° 45' 32.09" 74° 07' 37.56"	0 of 0	0	No core sample collected	---

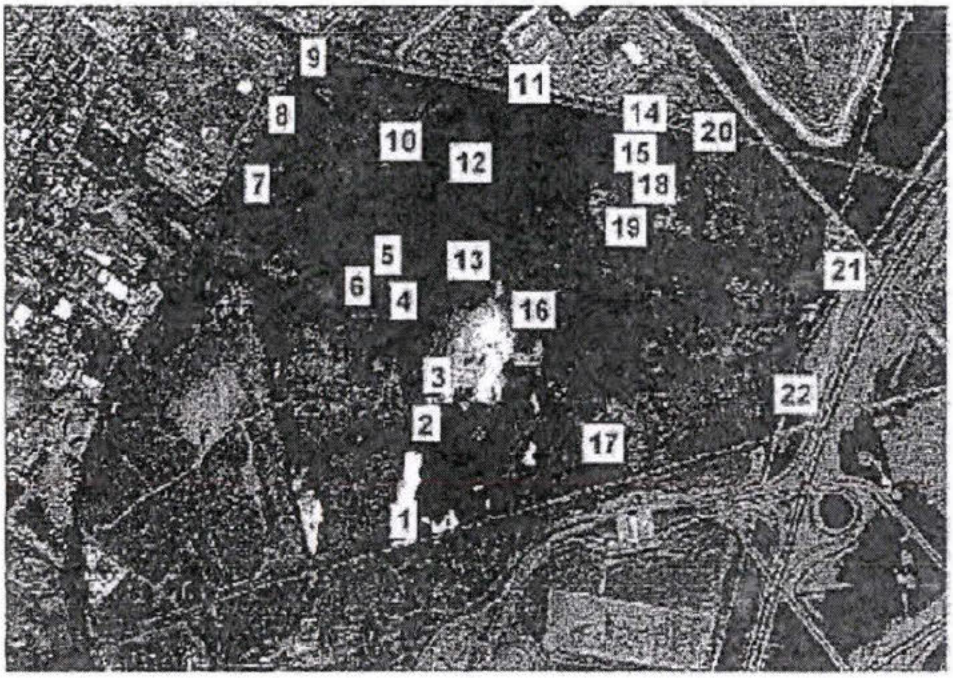
TABLE 2 (Continued)
Field Parameter Measurements and Observations
Water Sampling 7 & 8 April 1999 / Sediment Sampling 29 April 1999
Kearny Marsh - Kearny, NJ

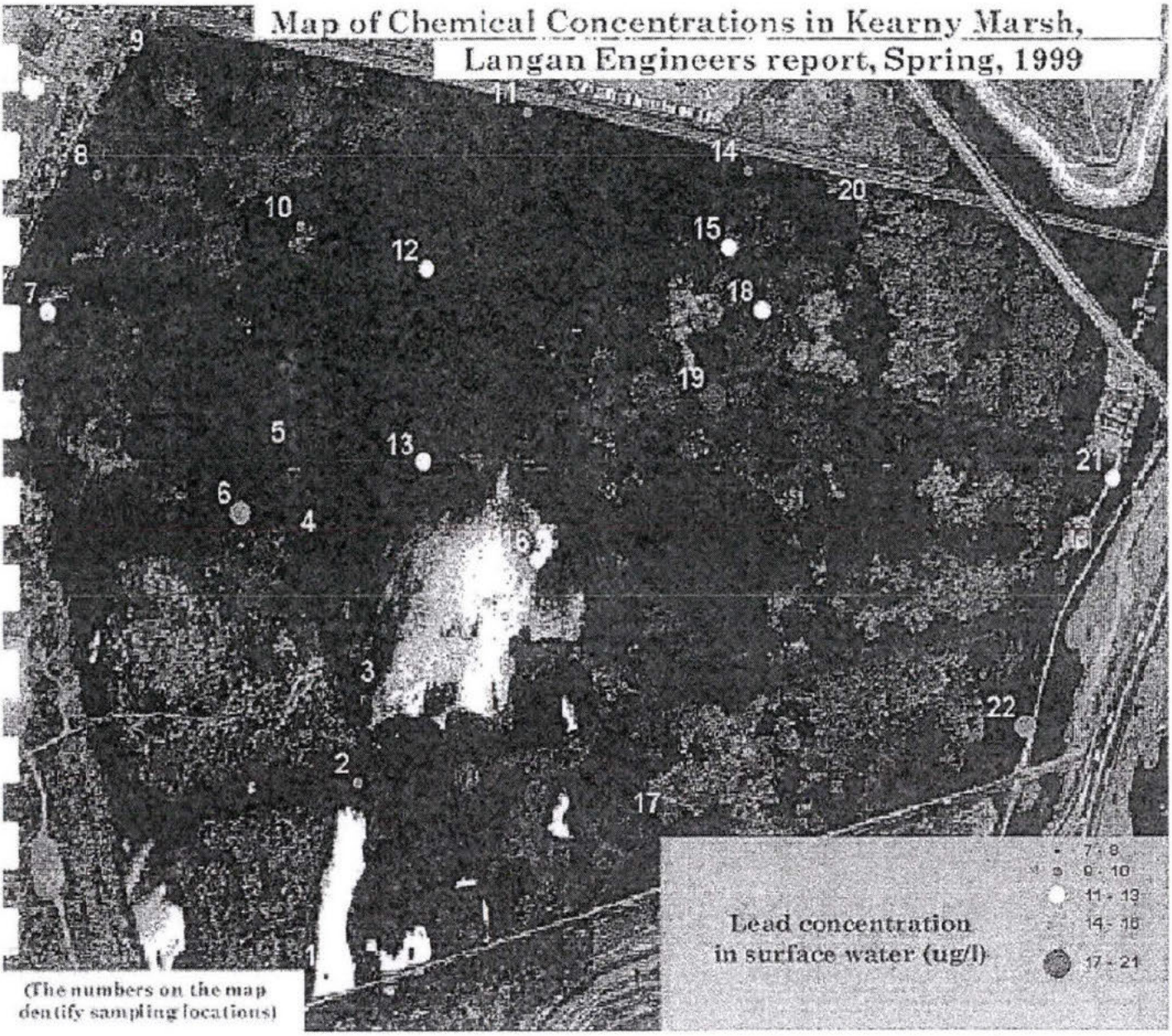
Sample Location	Field Parameters	Location (Lat./Long.)	Core Rec (ft)	Core Int. (ft)	Sediment Description	USCS Symbol
W-21	pH (std. Units): 8.15 Temp. (deg. C): 19.30 Spec. cond. (uS): 1282 ORP (mV): 112.10 Sal. (ppt): 0.70 DO (ppm): 11.40 Water depth (ft): 3.50	40° 45' 35.26" 74° 07' 03.11"	3 of 6	0-3	Brown PEAT and ORGANIC CLAY	PT/CL
W-22	pH (std. Units): 8.08 Temp. (deg. C): 18.90 Spec. cond. (uS): 1222 ORP (mV): 114.40 Sal. (ppt): 0.60 DO (ppm): 12.00 Water depth (ft): 2.00	40° 45' 25.10" 74° 07' 08.52"	0 of 0	0	No core sample collected	---

Notes:
1. Location determined by Aqua Survey, Inc. using Global Positioning System (GPS).
2. " --- " = data not collected or not applicable.
3. Cor Rec = length of core recovery of a maximum 6 feet.
4. Cor Int. = specific core interval.
5. Spec. cond. = specific conductance measured in microsiemens (uS).
6. ORP = oxidation-reductoin potential measured in millivolts (mV).
7. Sal. = salinity measured in parts per thousand (ppt).
8. DO = dissolved oxygen measured in parts per million (ppm).
9. USCS =Unified Soil Classification System.

Kearny Marsh - Water Data

Click on the number to display the water parameters for that area




Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
9
11
8
14
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5
13
21
6
4
16
3
22
2
17
1
Lead concentration
in surface water (ug/l)
7 - 8
9 - 10
11 - 13
14 - 16
17 - 21
(The numbers on the map
dentify sampling locations)

Chemical quality of water and sediments, Kearny Marsh			
WATER ANALYSES			
FIELD MEASUREMENTS			
Data from Table 2 of Langan Report on Kearny Marsh			
Sampled April and May, 1999			
Sample location			W7
Latitude			40 45' 42.45"
Longitude			74 08' 06.92
pH		std units	7.5
Temperatire		C	12.7
Specific conductivity		uS	2370
ORP		mV	117.2
Sal		ppt	1.2
DO		ppm	10
water depth		ft	3.5
LAB ANALYSES			
Data from Table 1 of Langan Report on Kearny Marsh			
Sample ID			W7
sampling Date	SWQS (surface water quality standards)	UNITS	4/7/99
VOLATILE ORGANIC COMPOUNDS			
Toluene	7.44	ug/l	ND
Chloroform	5.67	ug/l	ND
SEMIVOLATILE ORGANIC COMPOUNDS			
Di-n-butyl phthalate	3.53	ug/l	NA
Diethylphthalate	21.2	ug/l	ND
bis(2-Ethylhexyl)phthalate	1.76	ug/l	ND

SEMIVOLATILE ORGANIC TICs		ug/l	ND
Eicosane		ug/l	ND
Hexacosane		ug/l	ND
Heptacosane		ug/l	ND
Octocosane		ug/l	ND
Unknown alkanes		ug/l	
TOTAL PCBS		ug/l	ND
PESTICIDES			
4.4'-DD	0.000832	ug/l	ND
METALS			
Cadmium	10	ug/l	ND
Lead	5	ug/l	11.6
Silver	164	ug/l	ND
Zinc		ug/l	47
WET CHEMISTRY			
Cyanide	5.2,22,768,20900	ug/l	ND
Total petroleum Hydrocarbons		mg/l	ND
Corrosivity as pH	6.5-8.5	S.U	7.8
Total suspended solids	40	mg/l	15
Chemical Oxygen Demand		mg/l	59
Biochemical Oxygen Demand		mg/l	2.14
Total organic Carbon		mg/l	14.8
Total Kjeldahl Nitrogen		mg/l	1.3
Total Phosphate		mg/l	0.11
Chloride	230.000,250000,860000	ug/l	570000
Sulfate	250	mg/l	49
Color		pt.Co	50
Surfactants		mg/l	ND
Turbidity	50	N.T.U	9
Fecal Coliform	200	MPN/100ml	50
Phenol	20,900	ug/l	ND

Last Updated on 5/4/00
by TARA

Chemical quality of water and sediments, Kearny Marsh			
WATER ANALYSES			
FIELD MEASUREMENTS			
Data from Table 2 of Langan Report on Kearny Marsh			
Sampled April and May, 1999			
Sample location			W8
Latitude			40 45' 48.10"
Longitude			74 08' 3.86
pH		std units	7.65
Temperatire		C	12.8
Specific conductivity		uS	2008
ORP		mV	114.8
Sal		ppt	1
DO		ppm	13
water depth		ft	2.5
LAB ANALYSES			
Data from Table 1 of Langan Report on Kearny Marsh			
Sample ID			W8
sampling Date	SWQS (surface water quality standards)	UNITS	4/7/99
VOLATILE ORGANIC COMPOUNDS			
Toluene	7.44	ug/l	ND
Chloroform	5.67	ug/l	ND
SEMIVOLATILE ORGANIC COMPOUNDS			
Di-n-butyl phthalate	3.53	ug/l	40
Diethylphthalate	21.2	ug/l	ND
bis(2-Ethylhexyl)phthalate	1.76	ug/l	ND

SEMIVOLATILE ORGANIC TICs		ug/l	ND
Eicosane		ug/l	ND
Hexacosane		ug/l	ND
Heptacosane		ug/l	ND
Octocosane		ug/l	ND
Unknown alkanes		ug/l	
TOTAL PCBS		ug/l	ND
PESTICIDES			
4.4'-DD	0.000832	ug/l	ND
METALS			
Cadmium	10	ug/l	ND
Lead	5	ug/l	9.47
Silver	164	ug/l	ND
Zinc		ug/l	30
WET CHEMISTRY			
Cyanide	5.2,22,768,20900	ug/l	ND
Total petroleum Hydrocarbons		mg/l	ND
Corrosivity as pH	6.5-8.5	S.U	7.77
Total suspended solids	40	mg/l	17
Chemical Oxygen Demand		mg/l	50
Biochemical Oxygen Demand		mg/l	8.98
Total organic Carbon		mg/l	14.1
Total Kjeldahl Nitrogen		mg/l	1.3
Total Phosphate		mg/l	0.13
Chloride	230.000,250000,860000	ug/l	500000
Sulfate	250	mg/l	44
Color		pt.Co	40
Surfactants		mg/l	ND
Turbidity	50	N.T.U	11
Fecal Coliform	200	MPN/100ml	30
Phenol	20,900	ug/l	ND

Last Updated on 5/4/00
by TARA

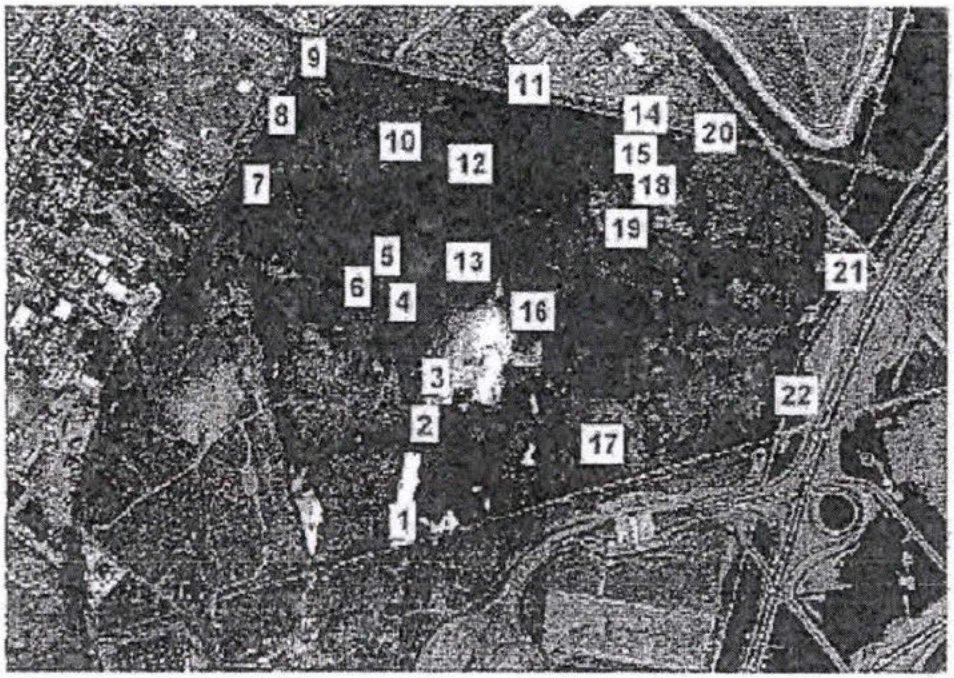
Chemical quality of water and sediments, Kearny Marsh			
NATER ANALYSES			
FIELD MEASUREMENTS			
Data from Table 2 of Langan Report on Kearny Marsh			
Sampled April and May, 1999			
Sample location			W9
Latitude			40 45' 52.82"
Longitude			74 08 00.40"
pH		std units	7
Temperatire		C	12.7
Specific conductivity		uS	163.6
ORP		mV	117.7
Sal		ppt	0.8
DO		ppm	8.88
water depth		ft	2.5
LAB ANALYSES			
Data from Table 1 of Langan Report on Kearny Marsh			
Sample ID			W9
sampling Date	SWQS (surface water quality standards)	UNITS	4/7/99
VOLATILE ORGANIC COMPOUNDS			
Toluene	7.44	ug/l	ND
Chloroform	5.67	ug/l	ND
SEMIVOLATILE ORGANIC COMPOUNDS			
Di-n-butyl phthalate	3.53	ug/l	NA
Diethylphthalate	21.2	ug/l	ND
bis(2-Ethylhexyl)phthalate	1.76	ug/l	ND

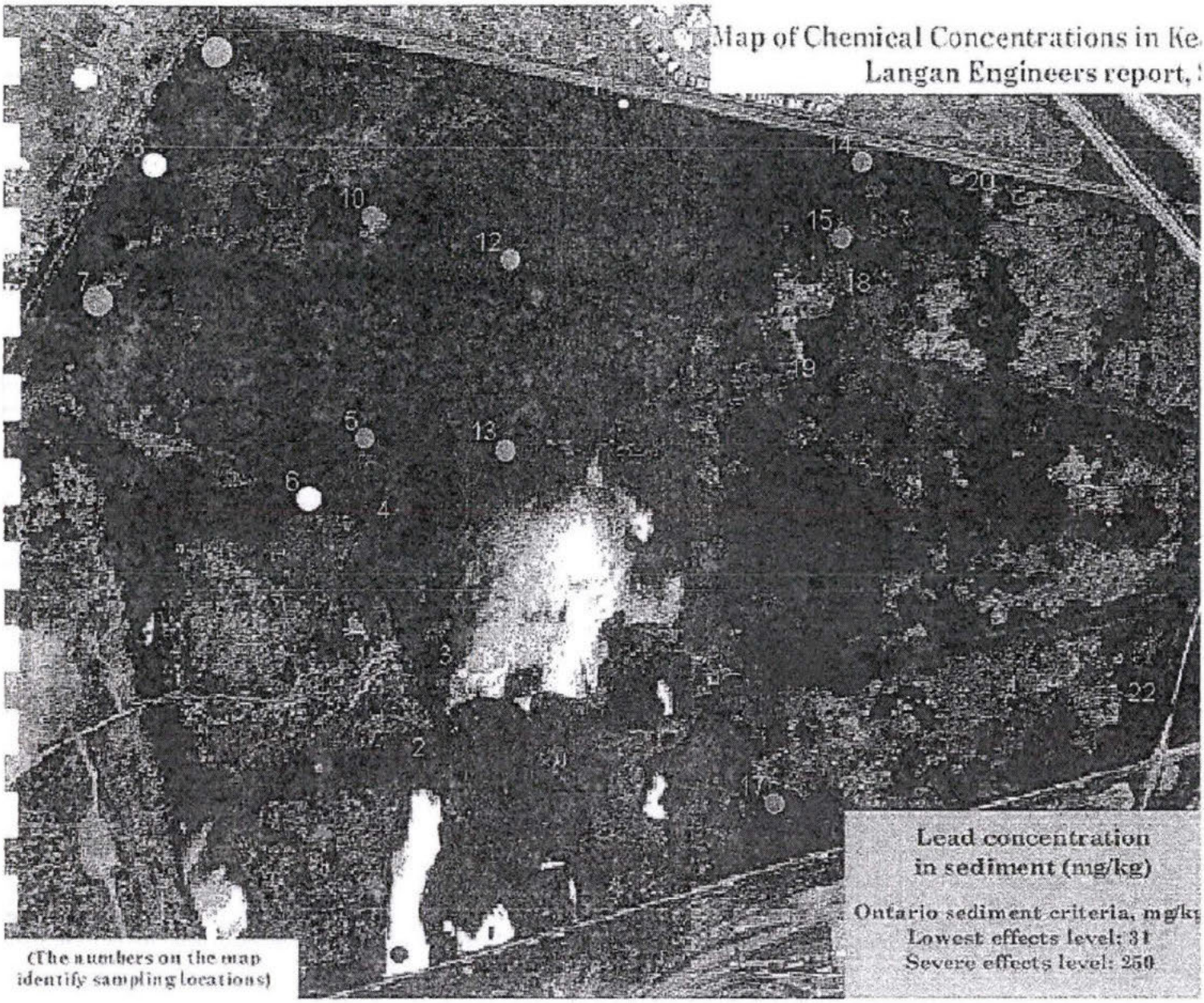
SEMIVOLATILE ORGANIC TICs		ug/l	ND
Eicosane		ug/l	ND
Hexacosane		ug/l	ND
Heptacosane		ug/l	ND
Octocosane		ug/l	ND
Unknown alkanes		ug/l	
TOTAL PCBS		ug/l	ND
PESTICIDES			
4.4'-DD	0.000832	ug/l	ND
METALS			
Cadmium	10	ug/l	ND
Lead	5	ug/l	7.33
Silver	164	ug/l	ND
Zinc		ug/l	47
WET CHEMISTRY			
Cyanide	5.2,22,768,20900	ug/l	ND
Total petroleum Hydrocarbons		mg/l	ND
Corrosivity as pH	6.5-8.5	S.U	7.53
Total suspended solids	40	mg/l	18
Chemical Oxygen Demand		mg/l	52
Biochemical Oxygen Demand		mg/l	5.89
Total organic Carbon		mg/l	12.96
Total Kjeldahl Nitrogen		mg/l	1.7
Total Phosphate		mg/l	0.16
Chloride	230.000,250000,860000	ug/l	400000
Sulfate	250	mg/l	39
Color		pt.Co	35
Surfactants		mg/l	ND
Turbidity	50	N.T.U	12
Fecal Coliform	200	MPN/100ml	3000
Phenol	20,900	ug/l	ND

Last Updated on 5/4/00
by TARA

Kearny Marsh - Sediment Data

Click on the number to display the sediment parameters for that area




Map of Chemical Concentrations in Ke
Langan Engineers report,
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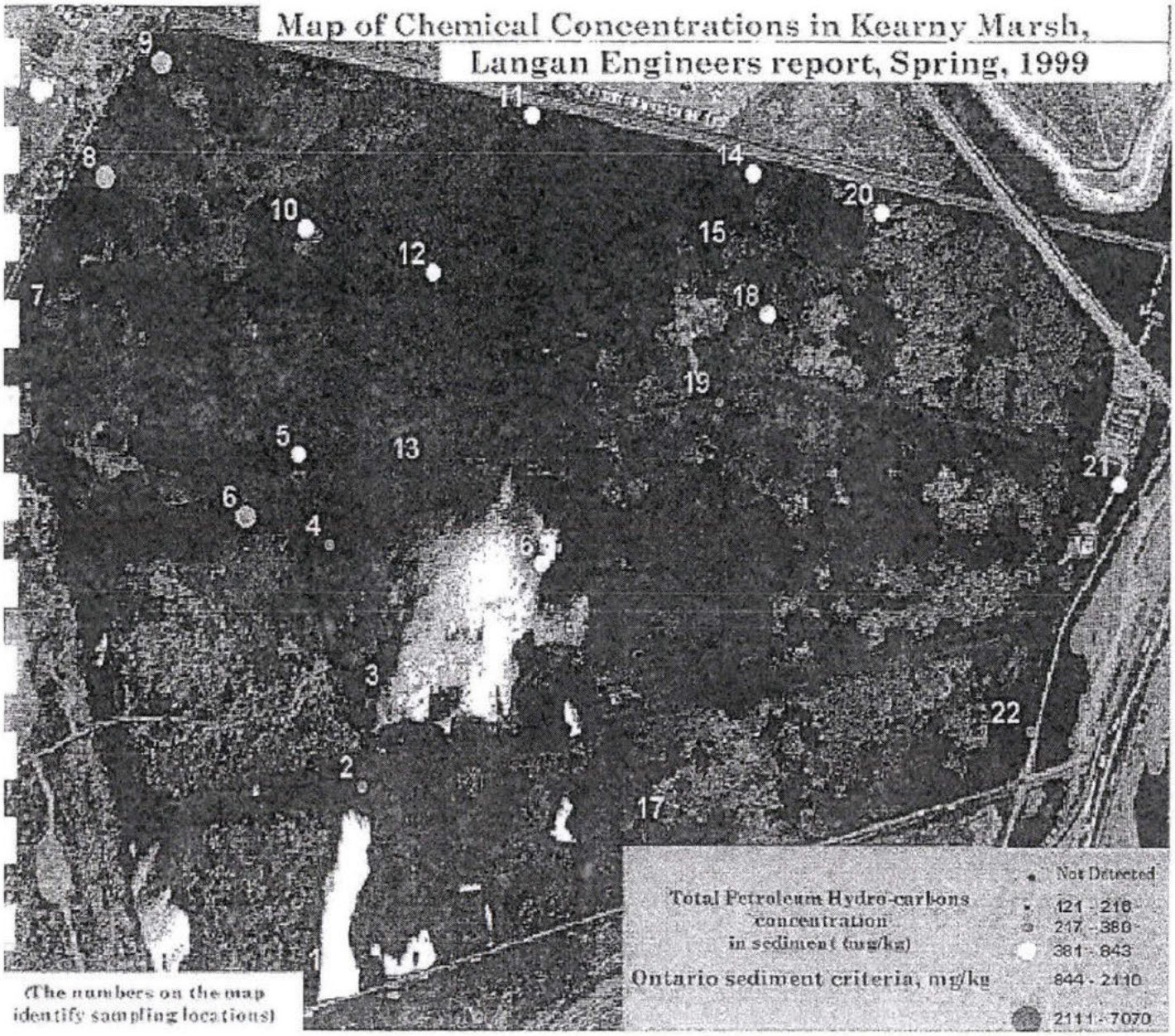
(The numbers on the map identify sampling locations)
Lead concentration in sediment (mg/kg)
Ontario sediment criteria, mg/k
Lowest effects level: 31
Severe effects level: 250


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
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19
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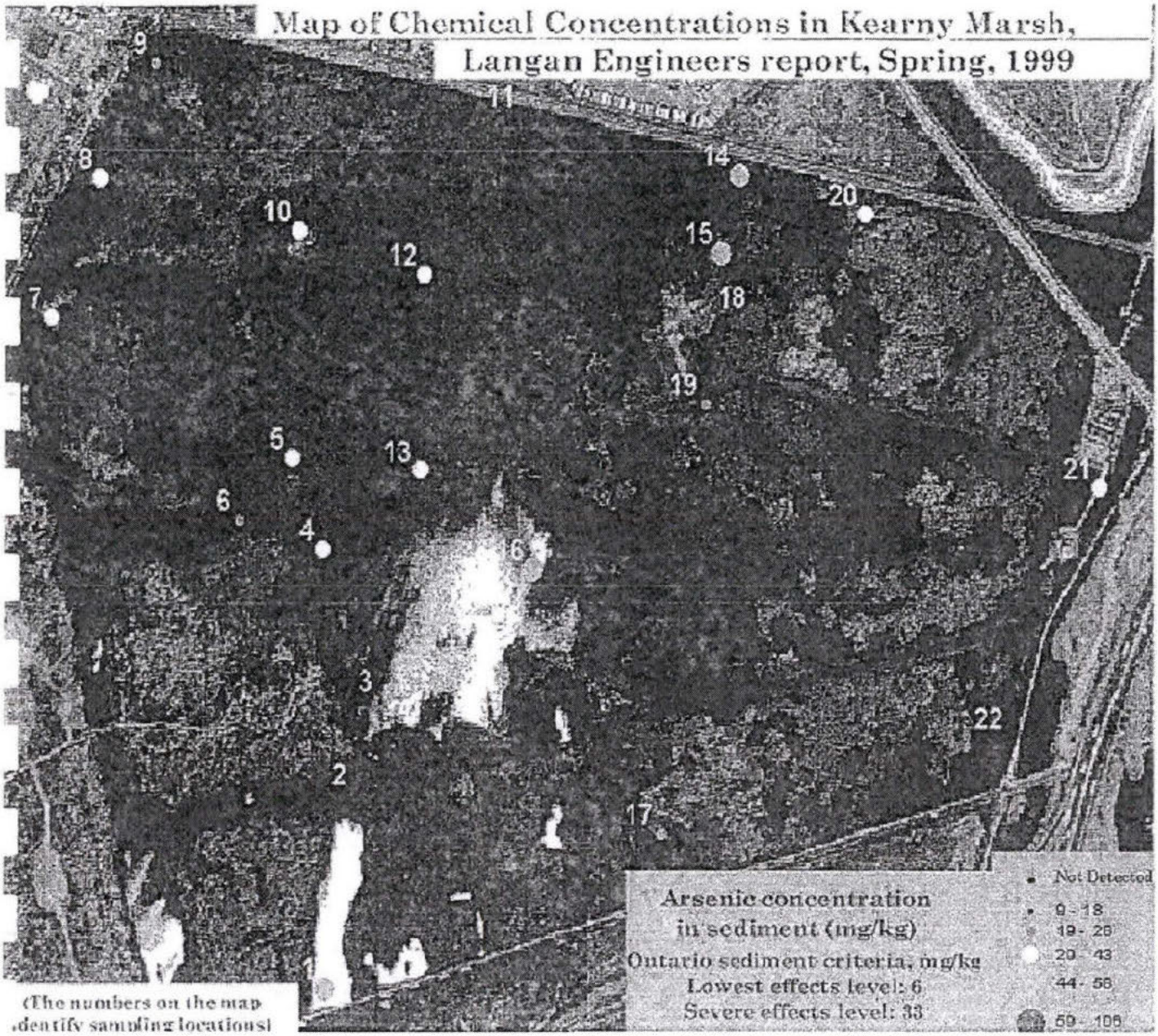
21
22
(The numbers on the map identify sampling locations)
Total Petroleum Hydro-carbons concentration in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Not Detected
121 - 216
217 - 380
381 - 843
844 - 2110
2111 - 7070


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
9
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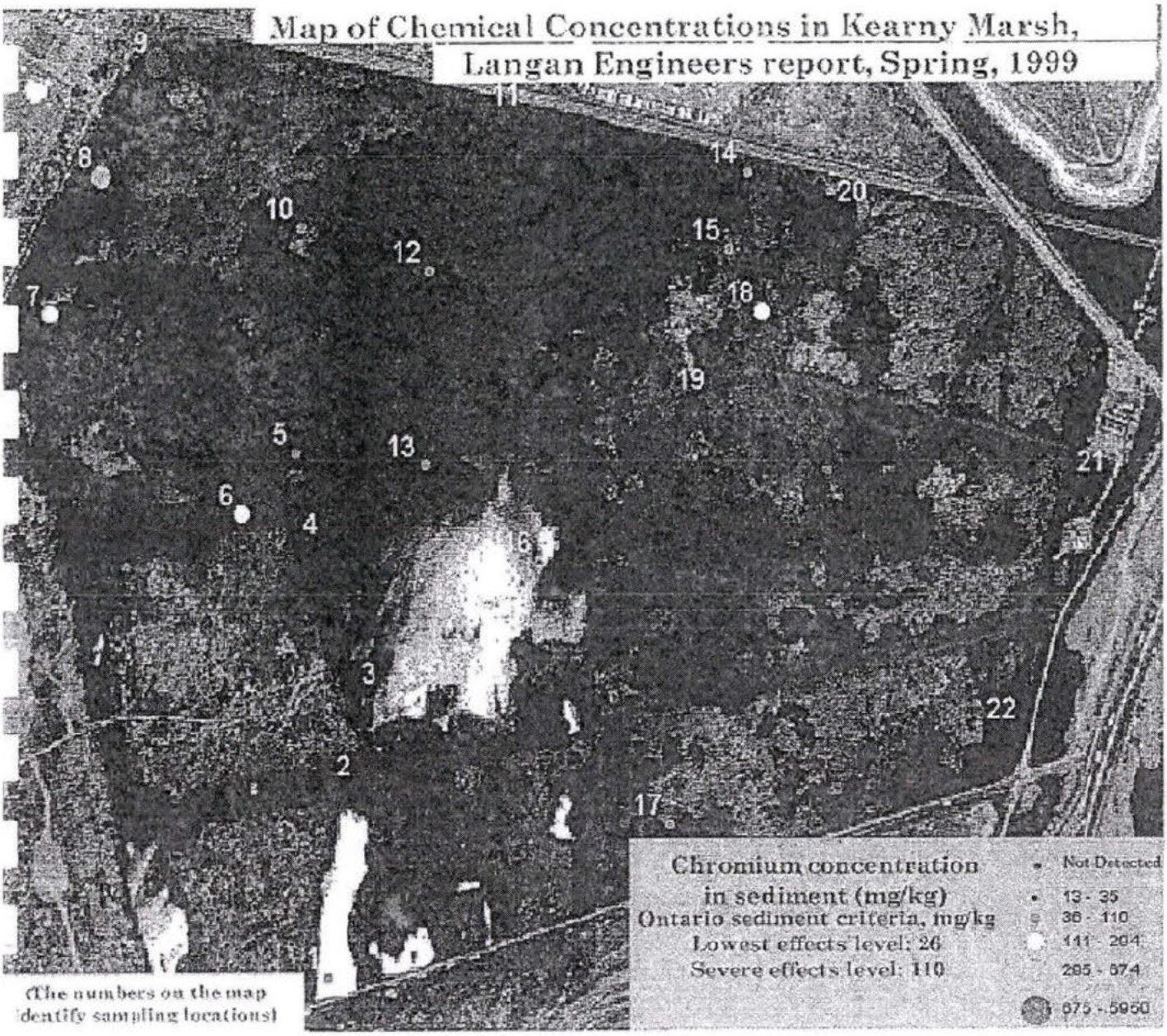
19
5
13
21
6
4
6
3
22
2
17
1
(The numbers on the map identify sampling locations)
Arsenic concentration in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Lowest effects level: 6
Severe effects level: 33
Not Detected
9 - 18
19 - 28
29 - 43
44 - 58
59 - 108


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
9
11
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14
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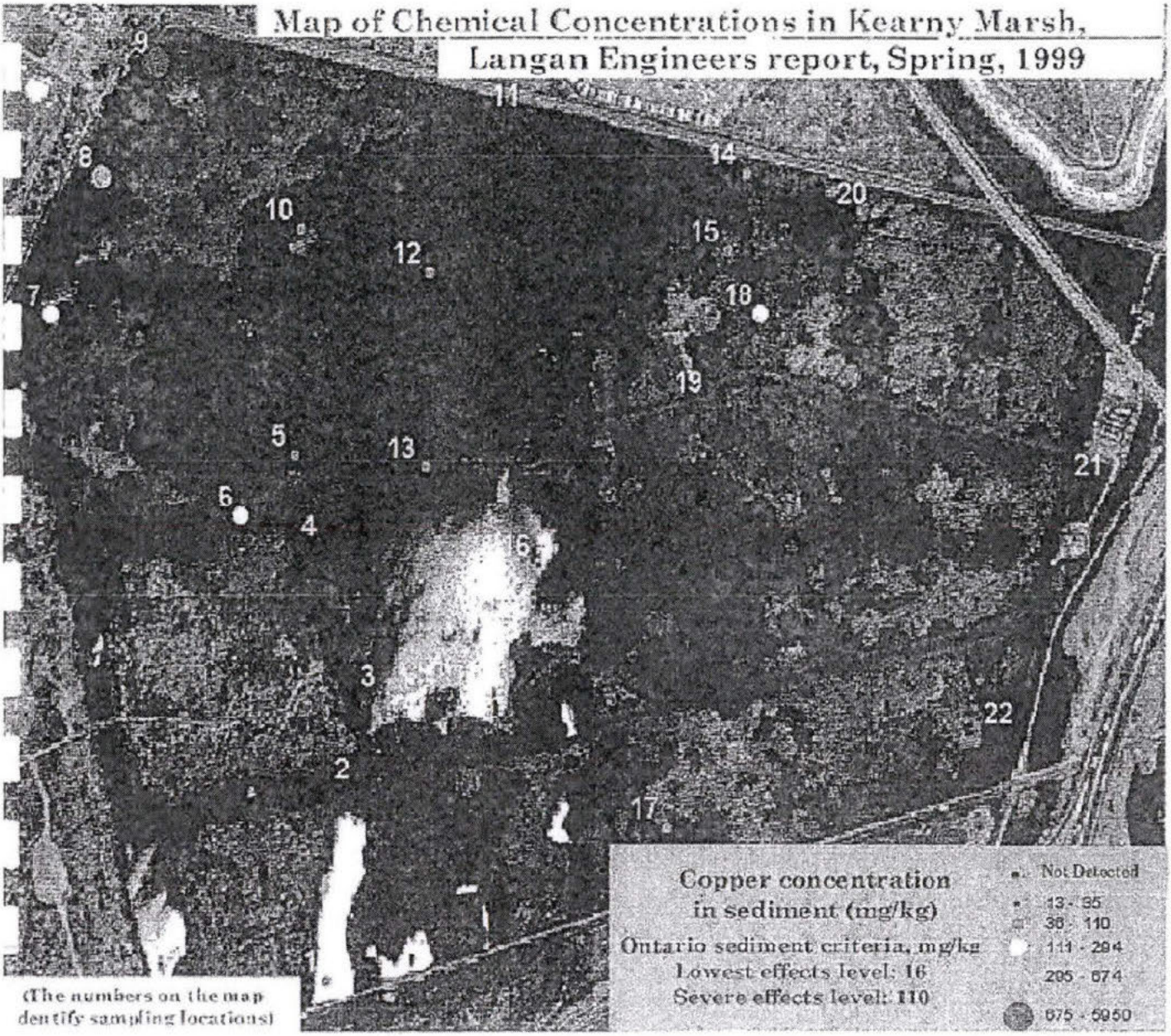
12
7
18
19
5
13
21
6
4
16
3
22
2
17
(The numbers on the map identify sampling locations)
Chromium concentration in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Lowest effects level: 26
Severe effects level: 110
Not Detected
13 - 35
36 - 110
111 - 294
295 - 574
575 - 5950


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
1
2
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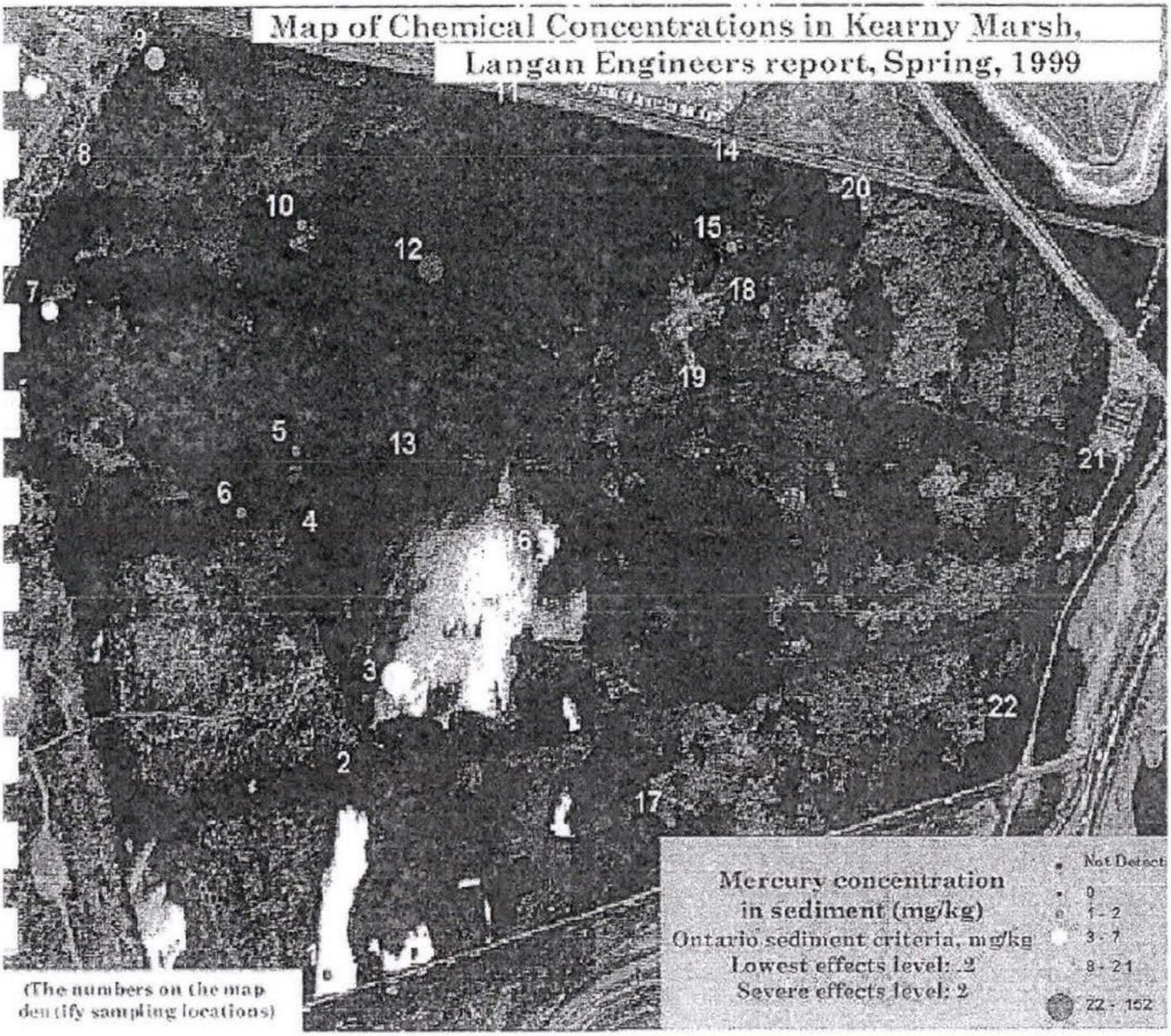
13
14
15
16
17
18
19
20
21
22
(The numbers on the map identify sampling locations)
Copper concentration in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Lowest effects level: 16
Severe effects level: 110
Not Detected
13 - 35
36 - 110
111 - 294
295 - 674
675 - 5950


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
1
2
3
4
5
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7
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9
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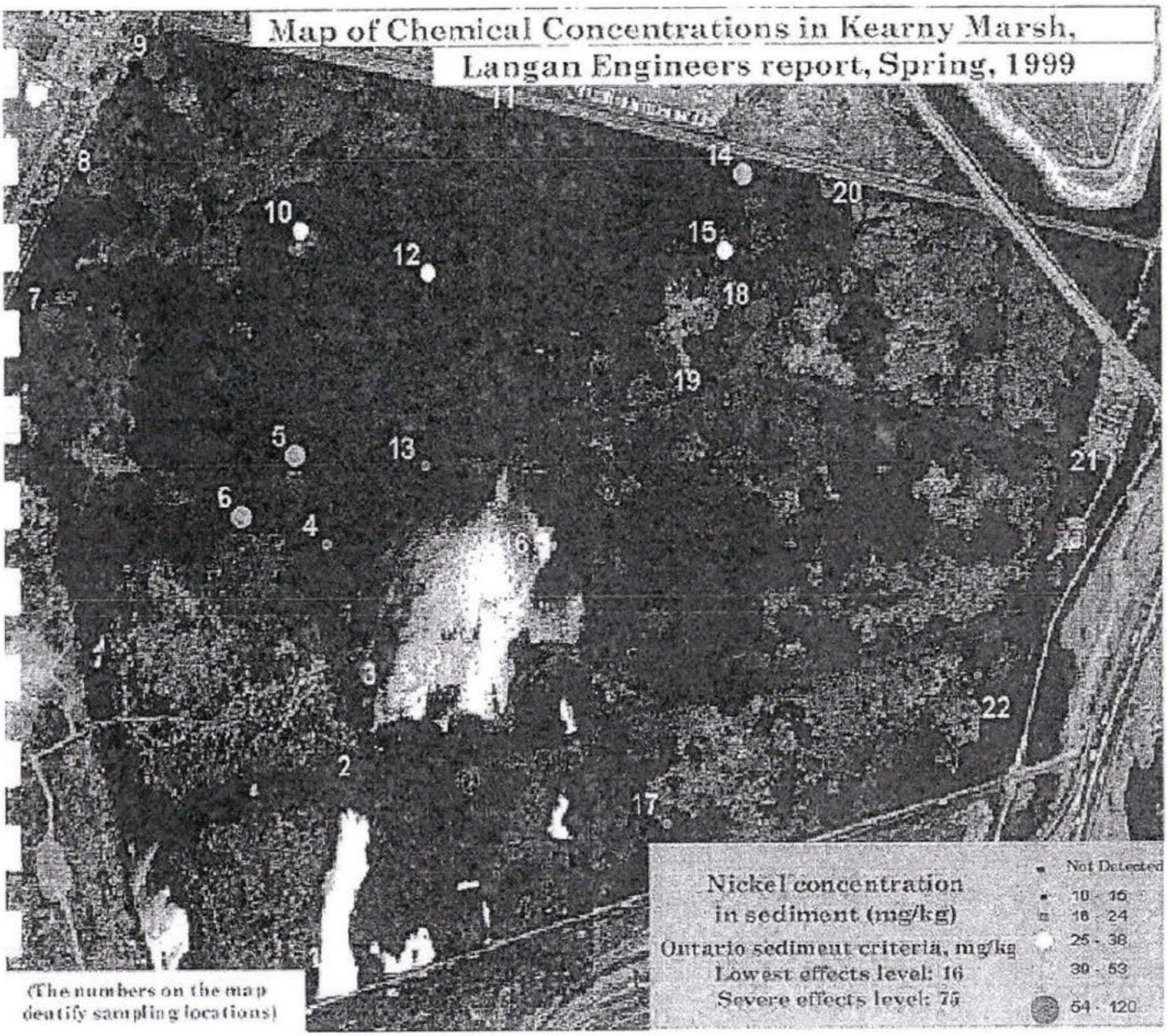
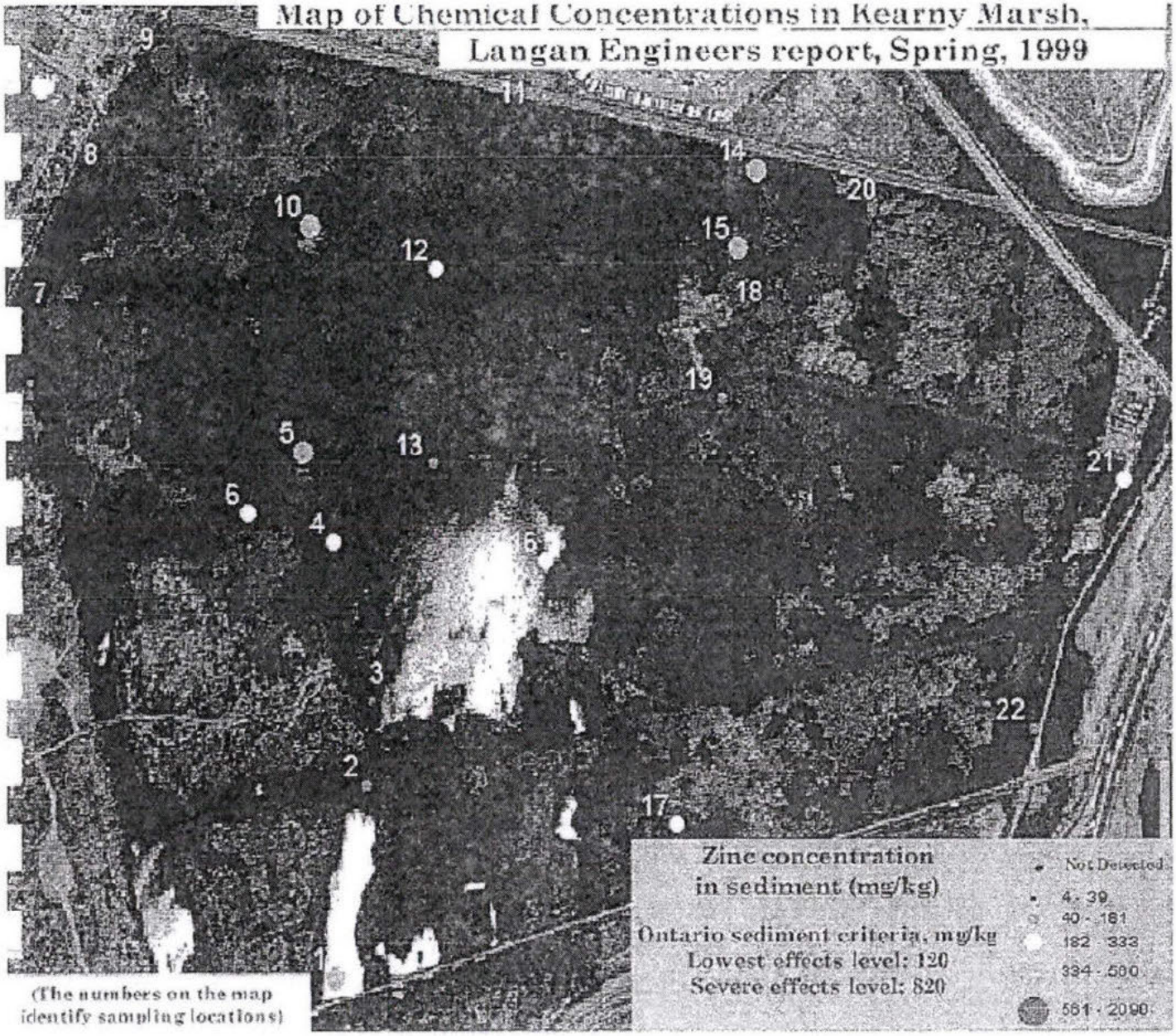
13
14
15
16
17
18
19
20
21
22
(The numbers on the map identify sampling locations)
Mercury concentration in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Lowest effects level: .2
Severe effects level: 2
Not Detect
0
1 - 2
3 - 7
8 - 21
22 - 152


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
9
8
10
12
7
14
20
15
18
19
5
13
21
6
4
22
2
17
(The numbers on the map
deatify sampling locations)
Nickel concentration
in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Lowest effects level: 16
Severe effects level: 75
Not Detected
10 - 15
16 - 24
25 - 38
39 - 53
54 - 120


Map of Chemical Concentrations in Kearny Marsh,
Langan Engineers report, Spring, 1999
9
11
8
14
20
10
15
12
7
18
19
5
13
21
6
4
6
3
22
2
17
Zinc concentration
in sediment (mg/kg)
Ontario sediment criteria, mg/kg
Lowest effects level: 120
Severe effects level: 820
Not Detected
4 - 39
40 - 181
182 - 333
334 - 560
561 - 2090
(The numbers on the map
identify sampling locations)

Chemical quality of water and sediments, Kearny Marsh							
SEDIMENT ANALYSIS							
Data from Table 3 of Langan Report on Kearny Marsh							
Sampled April and May, 1999							
Sample Location/ID				W7	W7A	W7B	W7C
Depth feet	Ontario Aquatic			0-0.5	0.5-1	1.5-2	2.5-3
	Sediment Criterion						
Sampling Date	LEL (lowest effects limit)	SEL (severe effects limit)	Units	4/29/99	4/29/99	4/29/99	4/29/99
VOLATILE ORGANIC COMPOUNDS							
Methylene Choride			mg/kg	ND	0.0299	0.067	0.0486
Total Xylenes			mg/kg	0.0201	0.00418	ND	ND
VOLATILE ORGANIC TICs							
Acetone			mg/kg	ND	ND	ND	ND
Substituted benzene			mg/kg	ND	0.0581	0.153	ND
Unknown alkane			mg/kg	1.1189	1.6057	1.5919	0.4349
Unknown			mg/kg	0.1987	0.0744	0.103	ND
Unknown aliphatic			mg/kg	0.0964	0.0772	0.4129	0.0295
Unkown cyclic hydrocarbon			mg/kg	ND	ND	0.124	0.1028
Unknown hydrocarbon			mg/kg	ND	ND	ND	ND
Unknown aromatic			mg/kg	ND	ND	0.141	0.113
SEMIVOLATILE ORGANIC COMPOUNDS							
Di-n-butyl phthalate			mg/kg	ND	ND	ND	ND
Phenanthrene			mg/kg				
Flouranthene	0.75	1,020	mg/kg	1.16	ND	ND	ND

Pyrene	0.49	850	mg/kg	1.62	ND	ND	ND
Butylbenzylphthalate			mg/kg	0.9	ND	ND	ND
Benzo(a)anthracene	0.32	1480	mg/kg	0.781	ND	ND	ND
Chrysene	0.34	460	mg/kg	0.99	ND	ND	ND
Benzo(b)flouranthene			mg/kg	1.07	ND	ND	ND
Benzo(k)flouranthene	0.24	1,340	mg/kg				
Benzo(a)pyrene	0.37	1,440	mg/kg	0.797	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.2	320	mg/kg				
Dibenz[a,h]anthracene			mg/kg				
bis(2-ethylhexyl)phthalate			mg/kg	35.6	5.23	1.34	0.363
Di-n-octylphthalate			mg/kg	4.45	1.19	ND	ND
Benzo(g,h,i)peryene	0.17	320	mg/kg				
Phenol			mg/kg				
SEMIVOLATILE ORGANIC TICS							
Uknown aromatic			mg/kg	ND	ND	ND	ND
Uknown			mg/kg	ND	ND	ND	ND
Uknown alkane			mg/kg	ND	ND	ND	ND
Vitamin E			mg/kg				
Substituted phthalate			mg/kg	20	ND	ND	ND
TOTAL PCBs			mg/kg	ND	ND	ND	ND
PESTICIDES							
alpha-Chlordane			mg/kg				
gamma-Chlordane			mg/kg				
4,4'-DDD	0.008	6	mg/kg	0.0136	0.0173	ND	ND
4.4'-DDT	0.008	71	mg/kg				
Aldrin	0.002	8	mg/kg				
4,4'-DDE	0.005	19	mg/kg				
Endrin Ketone			mg/kg				
METALS							
Antimony			mg/kg				
Arsenic	6	33	mg/kg	31.7	11.7	7.23	8.54
Berylium			mg/kg				
Cadmiun	0.6	10	mg/kg	12.5	8.23	3.85	3.76
Chromium	26	110	mg/kg	294	168	87.5	111

Copper	16	110	mg/kg	596	372	193	216
.ead	31	250	mg/kg	1260	803	460	367
Mercury	0.2	2	mg/kg	7.07	4.21	2.52	3.92
Nickel	16	75	mg/kg	120	75.1	31.2	29.7
Selenium			mg/kg	ND	5.28	ND	ND
Silver			mg/kg	ND	2.7	1.57	1.62
Thalium			mg/kg				
Zinc	120	820	mg/kg	1600	1060	561	467
VET CHEMISTRY							
Cyanide			mg/kg	20.6	ND	ND	ND
Phenol			mg/kg	1.42	ND	ND	ND
Total petroleum Hydrocarbons			mg/kg	7070	826	541	3820
Corrosivity as pH			S.U	7.2	7.58	7.75	8.08
Total organic carbons			mg/kg	16000	30000	28000	280000

ast Updated on 5/4/00
TARA

Chemical quality of water and sediments, Kearny Marsh							
SEDIMENT ANALYSIS							
Data from Table 3 of Langan Report on Kearny Marsh							
Sampled April and May, 1999							
Sample Location/ID				W8	W8A	W8B	W8C
Depth feet	Ontario Aquatic			0-0.5	0.5-1	1.5-2	2.5-3
	Sediment Criterion						
Sampling Date	LEL (lowest effects limit)	SEL (severe effects limit)	Units	5/26/99	4/29/99	4/29/99	4/29/99
VOLATILE ORGANIC COMPOUNDS							
Methylene Choride			mg/kg	ND	0.0244	205	0.0213
Total Xylenes			mg/kg	ND	ND	ND	ND
VOLATILE ORGANIC TICs							
Acetone			mg/kg				
Substituted benzene			mg/kg	ND	ND	ND	ND
Unknown alkane			mg/kg	ND	ND	ND	ND
Unknown			mg/kg	ND	ND	ND	ND
Unknown aliphatic			mg/kg	ND	ND	ND	ND
Unkown cyclic hydrocarbon			mg/kg	ND	ND	ND	ND
Unknown hydrocarbon			mg/kg	ND	ND	ND	ND
Unknown aromatic			mg/kg	ND	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS							
Di-n-butyl phthalate			mg/kg	0.751	ND	ND	ND
Phenanthrene			mg/kg	ND	ND	ND	ND
Flouranthene	0.75	1,020	mg/kg	ND	ND	ND	ND

Pyrene	0.49	850	mg/kg	ND	ND	ND	ND
Butylbenzylphthalate			mg/kg				
Benzo(a)anthracene	0.32	1480	mg/kg	ND	ND	ND	ND
Chrysene	0.34	460	mg/kg	ND	ND	ND	ND
Benzo(b)flouranthene			mg/kg	ND	ND	ND	ND
Benzo(k)flouranthene	0.24	1,340	mg/kg	ND	ND	ND	ND
Benzo(a)pyrene	0.37	1,440	mg/kg	ND	ND	ND	ND
Ideno(1,2,3-cd)pyrene	0.2	320	mg/kg	ND	ND	ND	ND
Dibenz[a,h]anthracene			mg/kg	ND	ND	ND	ND
bis(2-ethylhexyl)phthalate			mg/kg	0.86	ND	ND	ND
Di-n-octylphthalate			mg/kg				
Benzo(g,h,i)peryene	0.17	320	mg/kg	ND	ND	ND	ND
Phenol			mg/kg				
SEMIVOLATILE ORGANIC TICS							
Uknown aromatic			mg/kg	ND	ND	ND	ND
Uknown			mg/kg	ND	ND	ND	ND
Uknown alkane			mg/kg	ND	ND	ND	ND
Vitamin E			mg/kg				
Substituted phthalate			mg/kg				
TOTAL PCBs			mg/kg	ND	ND	ND	ND
PESTICIDES							
alpha-Chlordane			mg/kg	ND	ND	ND	ND
gamma-Chlordane			mg/kg	ND	ND	ND	ND
4,4'-DDD	0.008	6	mg/kg	0.0186	ND	ND	ND
4,4'-DDT	0.008	71	mg/kg				
Aldrin	0.002	8	mg/kg	ND	ND	ND	ND
4,4'-DDE	0.005	19	mg/kg	ND	ND	ND	ND
Endrin Ketone			mg/kg	ND	ND	ND	ND
METALS							
Antimony			mg/kg				
Arsenic	6	33	mg/kg	42.5	2.55	5.78	3.64
Berylium			mg/kg	ND	ND	ND	ND
Cadmiun	0.6	10	mg/kg	28.2	ND	1.35	0.558
Chromium	26	110	mg/kg	674	474	93	38

Copper	16	110	mg/kg	456	11.3	56.5	36.5
Lead	31	250	mg/kg	859	8.62	112	687
Mercury	0.2	2	mg/kg	152	141	20.6	1.06
Nickel	16	75	mg/kg	106	4.28	17	9.66
Selenium			mg/kg				
Silver			mg/kg	ND	ND	ND	ND
Thalium			mg/kg	ND	ND	ND	ND
Zinc	120	820	mg/kg	3.66	84.3	219	110
WET CHEMISTRY							
Cyanide			mg/kg	ND	ND	ND	ND
Phenol			mg/kg	ND	ND	ND	ND
Total petroleum Hydrocarbons			mg/kg	1640	69.6	183	74.8
Corrosivity as pH			S.U	6.9	7.62	7.43	7.08
Total organic carbons			mg/kg	38000	98000	58000	61000

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Chemical quality of water and sediments, Kearny Marsh							
SEDIMENT ANALYSIS							
Data from Table 3 of Langan Report on Kearny Marsh							
Sampled April and May, 1999							
Sample Location/ID				W9	W9A	W9B	W9C
Depth feet	Ontario Aquatic			0-0.5	0.5-1	1.5-2	2.5-3
	Sediment Criterion						
Sampling Date	LEL (lowest effects limit)	SEL (severe effects limit)	Units	5/26/99	4/29/99	4/29/99	4/29/99
VOLATILE ORGANIC COMPOUNDS							
Methylene Choride			mg/kg	ND	0.0189	0.0319	0.0411
Total Xylenes			mg/kg	0.00572	ND	ND	ND
VOLATILE ORGANIC TICs							
Acetone			mg/kg				
Substituted benzene			mg/kg	0.0399	0.0106	0.0186	ND
Unknown alkane			mg/kg	0.5079	0.012	ND	ND
Unknown			mg/kg	0.0642	0.0106	ND	ND
Unknown aliphatic			mg/kg	0.0808	ND	ND	ND
Unkown cyclic hydrocarbon			mg/kg	0.1934	ND	ND	ND
Unknown hydrocarbon			mg/kg	0.1122	ND	ND	ND
Unknown aromatic			mg/kg	0.382	ND	ND	ND
SEMIVOLATILE ORGANIC COMPOUNDS							
Di-n-butyl phthalate			mg/kg	ND	0.273	ND	ND
Phenanthrene			mg/kg	1.12	ND	ND	ND

Flouranthene	0.75	1,020	mg/kg	1.97	0.405	ND	ND
Pyrene	0.49	850	mg/kg	2.42	0.364	ND	ND
Butylbenzylphthalate			mg/kg				
Benzo(a)anthracene	0.32	1480	mg/kg	1.37	0.4	ND	ND
Chrysene	0.34	460	mg/kg	1.93	0.344	ND	ND
Benzo(b)flouranthene			mg/kg	2.25	0.585	ND	ND
Benzo(k)flouranthene	0.24	1,340	mg/kg	0.986	0.256	ND	ND
Benzo(a)pyrene	0.37	1,440	mg/kg	2.24	0.556	ND	ND
deno(1,2,3-cd)pyrene	0.2	320	mg/kg	1.22	0.407	ND	ND
Dibenz[a,h]anthracene			mg/kg	0.476	ND	ND	ND
bis(2-ethylhexyl)phthalate			mg/kg	4.97	ND	ND	ND
Di-n-octylphthalate			mg/kg				
Benzo(g,h,i)peryene	0.17	320	mg/kg	1.54	0.499	ND	ND
Phenol			mg/kg				
SEMIVOLATILE ORGANIC TICS							
Uknown aromatic			mg/kg	41.98	ND	6.7	ND
Uknown			mg/kg	ND	4.7	ND	ND
Uknown alkane			mg/kg	8.48	ND	22.64	ND
Vitamin E			mg/kg				
Substituted phthalate			mg/kg				
TOTAL PCBs			mg/kg	ND	ND	ND	ND
PESTICIDES							
alpha-Chlordane			mg/kg	0.0415	0.00645	ND	ND
gamma-Chlordane			mg/kg	0.0495	0.0071	ND	ND
4,4'-DDD	0.008	6	mg/kg	ND	0.00968	ND	ND
4,4'-DDT	0.008	71	mg/kg				
Aldrin	0.002	8	mg/kg	1.29	ND	ND	ND
4,4'-DDE	0.005	19	mg/kg	0.011	ND	ND	ND
Endrin Ketone			mg/kg	0.0183	ND	ND	ND
METALS							
Antimony			mg/kg				
Arsenic	6	33	mg/kg	28.3	6.64	5.49	4.27
Berylium			mg/kg	0.873	ND	ND	ND
Cadmiun	0.6	10	mg/kg	15	6.79	1.54	ND

Chromium	26	110	mg/kg	5950	91.5	174	30.7
Copper	16	110	mg/kg	478	167	67	31.6
Lead	31	250	mg/kg	1070	414	62.6	70.1
Mercury	0.2	2	mg/kg	20.5	158	7	0.43
Nickel	16	75	mg/kg	114	39.8	17.5	11.6
Selenium			mg/kg				
Silver			mg/kg	1.62	1.16	ND	ND
Thalium			mg/kg	0.421	ND	ND	ND
Zinc	120	820	mg/kg	2090	1660	750	235
WET CHEMISTRY							
Cyanide			mg/kg	5.37	ND	ND	ND
Phenol			mg/kg	ND	ND	ND	ND
Total petroleum Hydrocarbons			mg/kg	2110	757	1070	759
Corrosivity as pH			S.U	6.51	7.57	7.43	7.4
Total organic carbons			mg/kg	46000	34000	64000	82000

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ATTACHMENT D

Qualifications

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

ECOLSCIENCES, INC.
CORPORATE HISTORY

EcolSciences, Inc., was founded in 1973 in response to the growing need for responsible environmental planning, as mandated by NEPA, The National Environmental Policy Act. EcolSciences specializes in performing environmental investigations relating to permit acquisition and regulatory compliance, demonstration of "due diligence", waste management, impact analysis, mitigation and remediation. EcolSciences' strength is a proficiency in current environmental and waste management laws, regulations, and policies, coupled with a practical problem-solving approach to analyzing the environmental consequences of projects.

During its thirty-three years, EcolSciences has successfully completed more than 10,000 studies for private, quasi-public and public clients. EcolSciences has represented many of the country's leading industries, corporations, developers, and financial institutions including AT&T, American Cyanamid Company, Lucent Technologies, Merck, Johnson & Johnson, Hartz Mountain Industries, Exxon, K. Hovnanian Companies, Roseland Property Company, Trammell Crow Company, Principal Real Estate Investors, PNC Bank, The Bank of New York, and JP Morgan Chase. Among the many utilities that EcolSciences has served are Jersey Central Power & Light, New Jersey Natural Gas Company, Verizon Wireless, Sprint, Elizabethtown Gas Company, Essex and Hudson County Improvement Authorities, Ocean County Utilities Authority, and numerous municipal utilities authorities. Representative government agency clients include the U.S. Environmental Protection Agency, New York City Economic Development Corporation, New York City Department of Design and Construction, and New York City Department of Sanitation.

EcolSciences' interdisciplinary staff of environmental engineers, geologists, biologists and scientists has extensive experience in a diversity of studies related to biological assessment and toxic and hazardous materials management. EcolSciences has performed environmental assessments and has acquired appropriate permits and approvals under a wide variety of federal, state, regional, and local jurisdictions. These include, but are not limited to: federal Section 404 and Section 10 authorizations; New York SEQRA and CEQR approvals; New Jersey CAFRA, Waterfront Development, and Freshwater Wetlands Protection Act permits (both general and individual); NJ Pinelands Commission certifications; Hackensack Meadowlands Development Commission (HMDC) approvals; and Delaware & Raritan Canal Commission

approvals. EcolSciences' senior staff is experienced in the delivery of expert testimony; senior staff of the firm have testified in public hearings, Administrative Law proceedings, and county, regional and municipal planning boards.

Since the promulgation of the New Jersey Environmental Cleanup Responsibility Act (ECRA) and its successor, the Industrial Site Recovery Act (ISRA), EcolSciences has been involved in the implementation of the entire ECRA/ISRA program for its industrial clients. More recently, as the demonstration of "due diligence" has become a lending industry standard, EcolSciences has completed numerous Phase I environmental audits per ASTM E1527-05 and AAI and follow-up Phase II studies to clarify the level of environmental risk and liability associated with past and current practices at a particular site or facility. These audits typically include such activities as hazardous materials inventories, building and site inspections, subsurface soil investigations, groundwater monitoring, tank testing, asbestos bulk sampling, development of remediation plans and supervision of cleanup activities. The firm and technical staff members are also certified by the NJDEP for the performance of underground storage tank installation, closure, and subsurface evaluation. All work is conducted under the supervision of a licensed professional engineer.

The biological staff of EcolSciences has conducted over 4,000 wetland delineations and environmental assessments throughout the eastern and central portions of the United States. Our staff is skilled in all technical aspects of wetland identification and delineation methodologies established by the ACOE, USFWS, EPA and SCS; the assessment of wetland functions and values using techniques such as HEP, WET, and IVA; the assessment of development-related wetland impacts, the acquisition of wetland permits, and the development and implementation of mitigation plans. Key members of our staff are certified as Professional Wetland Scientists and provisionally certified by the ACOE. Additionally, EcolSciences' biologists routinely perform specialized studies related to federally- and state-listed threatened and endangered plant and animal species, wildlife habitat surveys, and the assessment of development-related impacts. Three of EcolSciences' biologists are USFWS Qualified bog turtle surveyors and two are NJDEP Qualified Ornithologists.

EcolSciences is a multi-disciplinary firm that has the experience and capabilities to provide a full range of environmental services. Studies are conducted in a manner that emphasizes the balance of environmental, engineering and cost factors. This approach provides the information necessary for sound and practical project decisions.

DAVID P. MOSKOWITZ

EDUCATION:

B.A., 1984 - Environmental Studies
George Washington University, Washington, D.C.

M.S. 2000 - Environmental Policy Studies
New Jersey Institute of Technology, Newark, N.J.

Ph.D. Program – Ecology and Evolution
Rutgers University, New Brunswick, N.J.

PROFESSIONAL AFFILIATIONS:

Society of Wetland Scientists
Association of Field Ornithologists
ASTM Environmental Committee (1998-2002)
Dragonfly Society of the Americas

PROFESSIONAL CERTIFICATIONS:

Professional Wetland Scientist - SWS
Certified Wetland Delineator - Corps of Engineers
USEPA Wetland Delineation - WTI
Qualified Ornithologist - NJDEP
Qualified Bog Turtle Surveyor - USFWS

OTHER:

Wetland Journal Technical Review Board (2000-2002)
SWS Certification Review Panel (1998-2001)
Poricy Park Board of Directors (1999-2002)
East Brunswick Environmental Commission
USFWS N.J. Breeding Bird Survey Coordinator (1995-1997)
Identification of Sedges and Rushes - Rutgers University
Field Identification of Raptors - University of Maine
Identification of Adult Dragonflies - University of Maine
Identification of Larval Dragonflies - University of Maine
Systematics & Conservation of Lepidoptera - University of Maine
Identification of Microlepidoptera – University of Maine

EXPERIENCE:

Mr. Moskowitz is a Senior Vice President with EcolSciences, Inc. During the past 20 years, Mr. Moskowitz has conducted more than 4,000 environmental studies for a wide range of clients including government agencies, and the development, legal, engineering and financial professions. These studies have focused on wetland and wildlife issues including delineations, mitigation, field surveys and regulatory compliance as well as Phase I, Phase II and Brownfields Redevelopment. Mr. Moskowitz has also provided expert testimony before numerous municipal boards and the New Jersey Meadowlands Commission and has been qualified as an expert in Superior Court of New Jersey, New Jersey Office of Administrative Law, New Jersey Condemnation Commission, and the Morris County Board of Taxation. Mr. Moskowitz has published more than two-dozen technical and popular papers on wildlife, wetland, and threatened and endangered species related topics and has lectured widely on numerous environmental topics.

Wetland Studies
Directed and participated in more than 3,000 field studies in NJ, NY, PA, MD and CT evaluating all aspects of wetland ecology. Representative experience includes:

- The evaluation of more than 10,000 acres in the New Jersey Highlands.
- The evaluation of more than 7,500 acres in the complex red soils of the New Jersey Piedmont.
- The evaluation of nearly 3,000 acres on Staten Island, New York.

Brownfields and Site Investigation Studies
Principal in charge of numerous Phase I Environmental Assessments, historic pesticide investigations and remediatial activities, hazardous waste investigations and brownfields redevelopment projects.

Wetland Mitigation Studies
Numerous mitigation plans have been prepared to remedy regulatory violations of various State and Federal wetland laws, and to compensate for wetland losses resulting from permitted wetland fills. Two examples of the wide variety of studies include:

Preparation of mitigation plans and specifications for the remediation of wetlands and shorelines of the Freshkills Sanitary Landfill, Staten Island, New York.

Design and implementation of a 13-acre wetland restoration project in Morris County, New Jersey utilizing air conditioning condensation as a hydrologic supplement.

Threatened and Endangered Species Studies
Designed, directed and participated in numerous field studies for rare plant and animal species including Bog Turtle, Wood Turtle, Northern Pine Snake, Blue Spotted Salamander, Long Tailed Salamander, Pine Barrens Tree Frog, Great Blue Heron, Coopers Hawk, Grasshopper Sparrow, Savannah Sparrow, Upland Sandpiper, Barred Owl, Swamp Pink, Knieskern's Beaked Rush, Curly Grass Fern and Barrett's Sedge.

Ornithological Studies
Numerous studies conducted throughout the northeast designed to evaluate and census individual species, avian communities and habitats, to assess potential impacts upon the species and habitats associated with land development proposals, and to comply with State and Federal Wildlife regulations. Two examples of the wide variety of studies include:

Long-eared owl habitat evaluation, pellet analysis and management plan in Somerset County, New Jersey.

Two-year avian census, habitat evaluation and regulatory assessment for the proposed redevelopment of Flushing Airport in Queens, New York by the New York City Economic Development Corporation. Breeding, wintering and migratory utilization of the site was comprehensively evaluated and barn owl pellet analysis was conducted to augment small mammal population studies.

Commercial/Residential/Industrial Studies

More than 3,000 properties have been evaluated throughout NJ, NY, PA, and CT to assess potential environmental impacts from proposed development and to insure regulatory compliance with various Local, State and Federal environmental laws. Tasks have included wetland delineation, permit acquisition and mitigation planning.

Corridor Studies

Designed, directed and participated in ecological studies and regulatory assessments for more than 350 linear miles of road corridors, gas and electric transmission right of ways and sewer and water alignments. Studies have been performed for the New Jersey Turnpike Authority, New Jersey DOT, Jersey Central Power and Light, New Jersey Natural Gas, and numerous local governments.

Special Environmental Studies

A wide range of ecological studies have been conducted for various private clients, the USEPA and other government agencies. Representative studies include:

- Bird, mammal, dragonfly, damselfly, butterfly and floral surveys for the proposed Catskill/Delaware Water Treatment Facility in Weschester County, New York.
- Habitat assessments for Pine Barrens Tree Frog and River Otter in New Jersey.
- An avifaunal study of a 500-acre proposed incinerator ash landfill site in New York, conducted for a county agency, to evaluate FAA concerns about bird strike hazards to aircraft passing over the site, resulting in the preparation of a Bird Deterrent Plan.
- Biological studies of the impacts of Folcroft Landfill upon ecological communities of Tinicum National Environmental Center, Philadelphia, PA for the USEPA, Region III.
- Red-Headed Woodpecker evaluation of two central New Jersey properties.

Publications/Articles

Moskowitz, D.P., 1996. Swamp Pink: A Federally-Listed Threatened Species. Wetland Journal 8(3): 14-16.

Moskowitz, D., Auffenorde, T. and M. Kovacs, (1997). Vegetation and Surrounding LandscapeCharacteristics of Long-Eared Owl (*Asio otus*) Winter Roosts in Central New Jersey. Records of New Jersey Birds. (23)1: 2-6.

Moskowitz, D.P., 1997. Wetland Restoration Using Non-Contact Cooling Water and Stormwater Runoff as a Supplemental Hydrologic Source. Wetland Journal 9(1): 17-20.

Moskowitz, D.P., 1997. Hine's Emerald Dragonfly (*Somatochlora hineana)*: The First FederallyEndangered Dragonfly. Wetland Journal (9)3: 12-14.

Moskowitz, D.P., 1997/98. Fall Migrant Landbird Observations at Sea. Records of New Jersey Birds. (23)4: 95.

Moskowitz, D.P., 1998. Build a Wetland Garden. Water Gardening Magazine (2)6: 58-60.

Moskowitz, D.P., 1998. Tips Offered on Negotiating N.J.'s Mining, Dredging Rules. Mine Regulation Reporter. 11(4): 86-87.

Moskowitz, D.P., 1998. Vegetation Change in a Forested Wetland after a Bird Roost. Northeastern Naturalist. 5(1): 61-66.

Moskowitz, D.P., 1998. A Wetland Delineation Primer for the Professional Land Surveyor. Professional Surveyor Magazine. 18(1): 22-28.

Moskowitz, D.P. and D.M. Bell., 1998. Archilestes Grandis (Great Spreadwing) in Central New Jersey, with Notes on Water Quality. Bulletin of American Odonatology. 5(3): 49-54.

Moskowitz, D.P., 1999. The Pine Barrens Treefrog (Hyla Andersonii): An Ecologist's Dream. Wetland Journal 11(4): 8-13.

Moskowitz, D.P., 2000. A Comparison of Field-Delineated Wetlands to the New Jersey Freshwater Wetland Maps. M.S. thesis - New Jersey Institute of Technology.

Moskowitz, D.P., 2000. Old Maps and Wetland Regulation. Professional Surveyor Magazine. 20(6): 22-30.

Moskowitz, D.P. and T.A. Auffenorde., 2000. Persistence of Skunk Cabbage (*Symplocarpus foetidus* [L.] Nutt.) in a Drained Wetland. Wetland Journal 12(3): 23-29.

Moskowitz, D., 2000. A New County Record for Archilestes Grandis in New York with Notes on Habitat and Water Quality. ARGIA 12(4): 7-8.

Moskowitz, D.P., 2000. Habitat Notes on a Winter Saw-whet Owl (*Aegolius acadicus*) Roost in Central New Jersey. Records of New Jersey Birds. 26(4): 138-139.

Moskowitz, D., 2000. Book Review: Dragonflies through Binoculars - A Field Guide to Dragonflies of North America. Wetland Journal 12(4): 41.

Poricy Park Citizens Committee. 2001. A Checklist and Guide to the Butterflies of Poricy Park. Pamphlet.

Moskowitz, D. P. 2001. First Record of the Queen Butterfly (*Danaus gilippus* Cramer) in New Jersey. News of the Lepidopterists' Society 43(3): 72, 74.

Moskowitz, D., J. Moskowitz, S. Moskowitz and H. Moskowitz. 2001. Notes on a large dragonfly and butterfly migration in New Jersey. Northeastern Naturalist 8(4): 483-490.

Moskowitz, D. P. 2002. An unusual interaction between a banded hairstreak butterfly (*Satyrium calanus*) Lycaenidae and a stink bug (*Banasa dimidiata*) Pentatomidae. Entomological News 113:(3) 183-186.

Moskowitz, D. P. 2002. Was there an invasion of the Queen butterfly (*Danaus gilippus*

Cramer) in the northeastern United States in 2001? News of the Lepidoptersists' Society 44(2): 66-67.

Newgard, L. and D. Moskowitz. Bog turtle: It's small, secretive, rare, and it's in our hiking region Trailwalker 29(4): p. 5.

Moskowitz, D.P. and C. Westphal. 2002. Notes on the larval diet of the Painted Lichen moth Hypoprepia fucosa: Hubner (Arctiidae:Lithosiinae). Journal of the Lepidopterist's Society 56 (4): 289-290.

Moskowitz, D. P. and T. M. Auffenorde. 2003. Bird Use at Two Simulated-Tree Cellular Towers in New Jersey. Records of New Jersey Birds. 28(4): p. 88-91.

Moskowitz, D.P. 2003. The Queen Dilemma in the Northeastern United States. New York State Butterfly Records 2002. New York Chapter, North American Butterfly Association. p. 49-51.

Moskowitz, D.P., Kovacs, M. and J. Tesauro. (in press). An abnormally-colored bog turtle (Clemmys muhlenbergii) in New Jersey. Herpetological Review.

MICHAEL KOVACS

EDUCATION:	*B.S., 1979 - Natural Resource Management* *Rutgers University, New Jersey*
AREAS OF EXPERTISE:	*Aquatic, Wetlands, and Terrestrial Ecology* *Threatened and Endangered Species* *Wetlands Construction and Restoration* *Environmental Impact Assessment and Mitigation Planning* *Project Management*
CERTIFICATIONS:	*Professional Wetland Scientist (SWS)* *Qualified Bog Turtle Surveyor (USFWS)* *Wetland Construction and Restoration (WTI)* *Qualified Ornithologist (NJDEP)* *Habitat Evaluation Procedure (USFWS)* *Health and Safety for Hazardous Waste Site Investigation Personnel (NJ/NY HMWTC)*
PROFESSIONAL ASSOCIATIONS:	*Society of Wetland Scientists* *American Fisheries Society* *Association of Field Ornithologists* *New Jersey Audubon Society*

EXPERIENCE:

Mr. Kovacs is a Vice President with EcolSciences, Inc. with over 23 years experience in the environmental consulting field. His areas of expertise lie in the inventory and evaluation of terrestrial, aquatic, and wetland systems, and with the assessment and mitigation of impacts associated with major development. Mr. Kovacs has directed and has participated in a wide variety of comprehensive ecological field studies providing a high degree of competence in sampling protocols and procedures as well as in the identification and ecology of aquatic/terrestrial vertebrate and invertebrate animal species, particularly threatened and endangered species. Elements of Mr. Kovacs' wetlands-related projects include: the delineation of wetlands through an analysis of soils, hydrology, vegetation and aerial photography; the characterization of wetland type; the evaluation of associated functions and values; assessment of development-related impacts; impact mitigation; wetlands construction and restoration; and permit acquisition. A summary of Mr. Kovacs' relevant project experience includes:

<u>Threatened and Endangered Species Studies</u>

- Numerous field surveys of Federally- and State-listed threatened and endangered species in NJ, NY and PA. Surveyed species included, but were not limited to: Swamp Pink, Knieskern's Beaked-rush, Blue-spotted Salamander, Long-tailed Salamander, Pine Barrens Treefrog, Cope's Gray Treefrog, Wood Turtle, Bog Turtle, Timber Rattlesnake, Northern

Pine Snake, Corn Snake, Cooper's Hawk, Red-shouldered Hawk, Bald Eagle, Peregrine Falcon, Barred Owl, Long-eared Owl, Red-headed Woodpecker, Bobolink, Grasshopper Sparrow, Vesper Sparrow, Savannah Sparrow, and American Bittern.

- A multi-year comprehensive survey of T&E plants and animals on a 1,000± acre site in Ocean County including trapping and radio-telemetry studies of Northern Pine Snake and surveys for the Federally-listed plant Knieskern's Beaked-rush.

- An inventory of various T&E species and other wildlife within a 2,000± acre site in Cumberland County, New Jersey for a sand mining concern.

- A survey of Timber Rattlesnake within the 2,300± acre Tuxedo Reserve site in Orange County, New York.

- An evaluation of eight NJ Superfund sites for the potential occurrence of the Federally-threatened plant species, Swamp Pink and Knieskern's Beaked-rush, for the USEPA, Region II.

Avifaunal and Other Wildlife Studies

- Intensive avifaunal field and literature studies associated with the preparation and implementation of a Bird Deterrent Plan required by the Federal Aviation Administration for a proposed ash-bypass landfill in Onondaga County, NY.

- Wintering/migratory bird field studies for the proposed redevelopment of Flushing Airport by the NYC Economic Development Corp. (formerly Ports and Trade).

- Seasonal wildlife field surveys associated with a SEQRA EIS for the Bloomingdale Park Eastern Recreational Facilities Program proposed by the NYC Department of Design and Construction.

Landfill Studies

- Aquatic/terrestrial field and literature studies associated with the preparation of a wetlands/shoreline remediation plan for the Fresh Kills Sanitary Landfill in NY.

- Biological studies of the impacts of Folcroft Landfill upon ecological communities of Tinicum National Environmental Center, Philadelphia, PA for the USEPA, Region III.

- Wetland and wildlife studies for the construction of a resource recovery facility and ash landfill for the Hudson County Improvement Authority.

Mining Studies

- Evaluation of the impacts of peat extraction on the functions and values of peatlands in the Pocono Mountain area of PA for the USEPA, Region III.
- Baseline environmental studies conducted for a proposed copper/zinc mine and associated NPDES permit in northern ME for the Superior Mining Company.
- Baseline aquatic surveys of two estuarine marsh systems proposed for phosphate mining for North Carolina Phosphate Company.
- Wetland impact assessment through photo-interpretation for a proposed phosphate mining project in FL for Farmland Industries, Inc.

Transmission Routing Studies

- Environmental inventory, impact assessment and mitigative planning for a power transmission line through CAFRA and Pinelands areas and for a transmission line in Newton, NJ for Jersey Central Power and Light Company.
- Environmental inventory, impact assessment and wetland permitting for a natural gas transmission line through Gloucester County, NJ for South Jersey Gas Company.

Oil Refinery and Port Studies

- Baseline ecological studies for a proposed oil refinery and port in North Carolina for the Brunswick Energy Company.

Special USEPA Studies

- Field studies and report preparation for the Advance Identification of Wetlands along Moshannon Creek near Philipsburg, PA for the USEPA, Region III.
- Field studies and report preparation for the Advance Identification of Wetlands along Bog Run near Quakertown, PA for the USEPA, Region III.
- A Status and Trends Analysis of Wetlands of Orange and Rockland Counties, NY through photointerpretation and ground-truthing for USEPA, Region II.
- An evaluation of wetlands creation for stormwater treatment within a proposed regional sedimentation pond in the Lickinghole Creek Watershed in VA for USEPA, Region III.

- An evaluation of the U.S. Army Corps' Nationwide Permitting process through study of headwater stream systems in northern NJ conducted for the USEPA, Region II.

- Preparation of a draft Advance Identification of Wetlands Technical Procedures Handbook for the USEPA, Region III.

Wetlands Mitigation Studies

- Preparation of a draft manual for USEPA, Region III entitled Creation of Wetland Banks for Mitigation of Impacts from Superfund Sites in New Castle County, DE.

- Preparation of Phase I and Phase II reports for USEPA Headquarters concerning the appropriateness of wetlands mitigation planning at Superfund sites.

- Preparation of wetland mitigation plans and specifications in conjunction with permits issued by the U.S. Army Corps of Engineers and various State agencies.

- Preparation of mitigation plans and specifications for the remediation of wetlands and shoreline areas of the Fresh Kills Sanitary Landfill, Staten Island, NY.

Wastewater Facility Studies

- Preparation of CAFRA EIS's and Freshwater Wetlands Permit applications for Ocean County Utilities Authority's Crestwood Interceptor, Ortley Beach-Alternate Bay Crossing, Toms River Crossing Relief Interceptor and Mill Creek Relief Interceptor projects.

- An evaluation of the State of Ohio's environmental plans and specification requirements for 201 facilities construction for the USEPA, Region V.

- Environmental compliance inspection of 201 facilities construction for the Manasquan River Regional Sewerage Authority and Ocean County Utilities Authority.

- Wastewater facilities planning for Atlantic Highlands/Highlands Sewerage Authority, Bayshore Regional Sewerage Authority, Long Branch Sewerage Authority, Tri-Borough Sewerage Authority, and Tri-Municipal Sewerage Commission.

Commercial/Industrial/Residential Studies

- Wetlands delineation, impact assessment, permit acquisition and mitigation planning for more than 1,500 development projects in NY, NJ, PA, CT, ME and NH.

- Preparation of NJ CAFRA, Waterfront Development, and Stream Encroachment EIS's and NY SEQRA and CEQR EIS's.

- Preparation of EIS's for major developments for use in submissions to municipalities and the provision of expert testimony.

CHRIS S. KOUTOUZAKIS

EDUCATION:

Master of Environmental Management, May 1996, Nicholas School of the Environment, Duke University, Durham, North Carolina
Concentration: Environmental Toxicology, Chemistry, and Risk Assessment

BA Biology, May 1993, Emory University, Atlanta, Georgia
Minor: Biological Anthropology

AREAS OF EXPERTISE:

Preparation of environmental resources reports, environmental impact statements, and environmental assessments
Wetlands delineation and permitting
Wetlands mitigation and design
Baseline ecological evaluations and ecological risk assessments
Wildlife habitat assessments
Endangered species surveys
Fish and Wildlife collection surveys
Site investigations, including sampling relating to the characterization of contamination in groundwater, surface water, soil, sediment, and other environmental media

PROFESSIONAL ASSOCIATIONS & CERTIFICATIONS:

Society of Wetland Scientists - Professional Wetland Scientist # 1702
Methodology of Delineating Wetlands Training Course, Cook College, Rutgers University
OSHA 1910.120 40-hour HAZWOPER Training

During the past 10 years, Mr. Koutouzakis has conducted a number of environmental studies for a wide range of clients including federal and local government agencies, development and legal professions, and private industry. Elements of Mr. Koutouzakis' wetlands-related projects include: the delineation of wetlands through an analysis of soils, hydrology, and vegetation; the characterization of wetland type; the evaluation of associated wetland functions and values; assessment of development-related impacts; impact mitigation; wetlands construction and restoration; and permit acquisition. Mr. Koutouzakis is currently a Project Manager with EcolSciences, Inc. His primary responsibilities are assisting with project management, the design and implementation of technical field studies, and regulatory analysis and compliance. A summary of relevant project experience includes:

EXPERIENCE:

Threatened and Endangered Species Studies

Proposed WSNR Radio Towers Site, Carlstadt, NJ – Completed a threatened and endangered species impact assessment for a tidal wetland area along the Hackensack River in order to investigate potential impacts to threatened and endangered species by the proposed construction of seven radio communication towers and associated structures.

Surveys of Proposed Development Properties for Threatened and Endangered Amphibian Species - Performed habitat evaluation and species-specific surveys for Southern gray tree frogs and Pine Barrens tree frogs on proposed development properties in Stafford, NJ and Galloway, NJ. Surveys included performing call surveys and assessing suitability of habitat for breeding activities. Also conducted surveys for long tailed salamanders on a project site in Kingwood, NJ.

Surveys of Proposed Development Properties for Threatened and Endangered Bird Species - Performed habitat evaluation and species-specific surveys for species such as barred owls, red-shouldered hawks, cooper's hawks, and red-headed woodpeckers on proposed development properties in Stafford, NJ, Buena Vista, NJ, Hamilton, NJ, Galloway, NJ, and Staten Island, NY. Surveys included performing call surveys, nest searches, and assessing suitability of habitat for nesting and/or foraging.

Surveys of Proposed Development Properties for Threatened and Endangered Reptile Species - Performed habitat evaluation and/or species-specific surveys for northern pine snakes on proposed development properties in Stafford, NJ, Hammonton, NJ, Toms River, NJ, Berlin, NJ, Manchester, NJ, Winslow, NJ, Buena Vista, NJ, and Hamilton, NJ. Supervised contractor installation of silt fence trap lines and conducted installation of funnel/box traps along trap lines. Surveys included checking trap lines and performing grid searches for any and all snake activity. Certain captured pine snake individuals were fitted with radio tracking devices by a licensed veterinarian in order to radio track them for determination of their respective territories, and nesting and hibernaculum locations.

Surveys of Proposed Development Properties for Threatened and Endangered Plant Species - Performed habitat evaluation and species-specific surveys for small whorled pogonia on proposed development properties in Monroe County, PA. Surveys included extensive searching activities at a 3,200-acre project site.

Surveys of Proposed Runway Extension/Expansion for Threatened and Endangered Bird, Insect, and Plant Species - Served as field team leader for surveys of threatened and endangered species and habitat assessments for a proposed runway expansion project at Pope Air Force Base in Fayetteville, North Carolina. Species/habitats surveyed for included red cockaded woodpecker, Mitchell's satyr, and Micheaux's sumac (Project work conducted with previous employer).

Surveys for Bog Turtles - Performed habitat assessments and presence/absence surveys for bog turtles at various wetland locations along pipeline rights-of-way in eastern Pennsylvania (Project work conducted with previous employer). Also conducted presence/absence surveys for bog turtles at properties in Hardyston, NJ, Woolwich, NJ, and Lafayette, NJ.

Wetland Delineation and Permitting

Washington, NJ – Conducted a wetland/waters delineation of 130± acres in the newly established Highlands Preservation Area and prepared an application for a Highlands Resource Area Determination (HRAD) from NJDEP.

Pocono Manor, PA – Conducted a wetland/waters delineation of 3,200± acres in Monroe County, PA and prepared materials for submission to the United States Army Corps of Engineers for a Jurisdictional Determination.

Lyndhurst, Rutherford, and East Rutherford, NJ – Conducted wetland delineations at various sites in the Meadowlands area of NJ and prepared materials for submission to the United States Army Corps of Engineers for a Jurisdictional Determination.

Maywood FUSRAP Site, Maywood, NJ – Conducted a wetland delineation on contaminated site properties. Surveyed delineated wetland lines using a back-pack GPS unit in order to produce accurate site figures. Assisted with the preparation of the NJ Freshwater Wetland permit applications (Project work conducted with previous employer).

Fort McClellan, Calhoun County, AL – Identified and delineated federally jurisdictional wetlands within a 200-foot perimeter of ten historic landfills and fill areas on the base. A delineation report was created for the Base Realignment and Closure (BRAC) Environmental Restoration Program which requires investigation and cleanup of federal properties prior to transfer to the public domain (Project work conducted with previous employer).

Bayway Refinery, Linden, NJ – Conducted the refinery wide wetland delineation for the application for a new Letter of Interpretation (LOI) approving state recognized wetland boundaries. Directed the preparation of wetland permit applications and a wetland mitigation plan for a 217,800 square foot freshwater and brackish wetland mitigation project. The mitigation plan involved contour design, a water budget, and selection of appropriate wetland plant species for planting activities (Project work conducted with previous employer).

Freshkills Landfill, Staten Island, NY – Prepared wetland permitting documents/application required for installation of a new supplemental leachate collection system for landfill sections 2/8 and 3/4 (Project work conducted with previous employer).

Fiber Optic Right-of-Way, PA - Assisted in a 600-mile fiber-optic network right-of-way project. The project involved identifying all federal, state, and local regulatory issues including wetlands, threatened and endangered species, cultural resources, and storm-water and soil erosion control. Endangered Bog Turtle surveys were conducted at certain proposed resource crossings of this network. The network right-of-way was proposed to run from Cleveland, Ohio to Philadelphia, Pennsylvania (Project work conducted with previous employer).

Baseline Ecological Evaluations

Mr. Koutouzakis has conducted baseline ecological evaluations for rural, suburban, and urban sites in Lopatcong/Pohatcong, NJ, East Rutherford, NJ, Secaucus, NJ, Sayreville, NJ, Fort Dix, NJ, Woodcliff Lake, NJ, Edison, NJ, Florham Park, NJ, Ewing, NJ, and numerous other NJ municipalities. These evaluations consisted of habitat characterizations, listing of constituents of potential ecological concern (COPECs) based on hazard quotient calculation using ecological screening benchmark values, and discussion of potential contaminant migration pathways and exposure scenarios.

Lopatcong/Pohatcong, NJ – This site was located on top of a portion of a geologic formation with very high background arsenic levels, which accounted for some of the elevated arsenic levels observed in on-site media.

Sayreville, NJ – A baseline ecological evaluation in Sayreville included sediment sampling in order to further characterize COPECs in a stream on-site (Project work conducted with previous employer).

Wildlife Studies

GATX and Duke Energy Properties, Staten Island, NY – Conducted wildlife surveys (concentrating on birds, fish, and benthic macroinvertebrates) in the Gulfport Marsh area of Staten Island in order to characterize the natural resources of the site as part of an environmental impact statement for a proposed NASCAR raceway.

WSNR Radio Towers Site, Lyndhurst, NJ – Conducted bird surveys in the area underneath and around five radio towers located in the meadowlands area of NJ, in order to investigate the potential of bird kills caused by the radio towers. Bird species on and around radio tower areas were identified and any and all feathers and/or dead birds were collected for submission to the United States Fish and Wildlife Service. A prey removal study was also conducted at the site using farm raised quail placed in various locations in order to potentially establish a prey removal rate.

Proposed WSNR Radio Towers Site, Carlstadt, NJ – Conducted an Essential Fish Habitat (EFH) assessment for a tidal wetland area along the Hackensack River, in order to investigate potential impacts to different life stages of native fish species by the proposed construction of seven radio communication towers and associated structures. A threatened and endangered species impact assessment was also completed for the proposed project.

Private Radionuclide Storage Facility, Goshute Reservation, Skull Valley, Tooele County, UT – Assisted the team leading wildlife biologist in surveying project areas for the presence of nesting raptors. The proposed locations of the storage facility, a 30-mile stretch of railway (including 0.5 miles to either side), and the connection point of the proposed railway to the existing railway were visually surveyed for signs of nesting raptors. The primary raptors encountered nesting in the desert habitat in the project area were Burrowing Owls. Burrowing owl nesting sites were visually located and subsequently surveyed using a GPS unit. (Project work conducted with previous employer.)

Wetland Mitigation & Design

Wyckoff's Mills Wetland Mitigation Bank, Monroe, NJ – Assisted in the oversight and planting of over 50,000 bare root trees and shrubs, and the subsequent monitoring in one of the largest wetland mitigation bank projects in NJ (approximately 130 acres) (Project work conducted with previous employer).

Chemical Leaman Tank Lines Superfund Site, Bridgeport, NJ – Assisted in the characterization and mapping of distinct wetland communities on-site. Prepared a wetland mitigation and monitoring plan associated with the removal of contaminated surficial sediments in wetland areas on-site. Handled the application procedure and preparation of wetland general permits and stream encroachment permits necessary for project completion (Project work conducted with previous employer).

Chimento Wetland Mitigation Bank, Little Silver, NJ - Completed the enhancement of tidal wetland areas off of the Shrewsbury River in Little Silver, New Jersey. This project involved the control of the invasive species *Phragmites australis*, and the oversight and planting of approximately 4,200 herbaceous plants and shrubs of various species in tidal wetland areas. The completed enhanced wetland area will be utilized for wetland mitigation banking purposes (Project work conducted with previous employer).

Langley Air Force Base, Hampton, VA – Supervised and carried out wetland mitigation planting activities at LF –7 (Landfill-07). 22,000 2-inch plugs and 100 shrubs were planted in areas slated for wetland enhancement and creation. Supervised and carried out numerous other wetland restoration activities involving choice of species composition and planting. Conducted a base-wide wetland

delineation in order to ground truth previous delineation maps created using aerial photography and infrared imaging (Project work conducted with previous employer).

Kin-Buc Landfill, Edison, NJ – Assisted with the evaluation and implementation of a 12-acre freshwater and saltwater wetland mitigation project in Edison, New Jersey. This wetland mitigation project involved the removal of *Phragmites australis*, or Giant Reed, from an area of tidal marsh associated with the Raritan River. The wetland system was monitored on a semi-annual basis to observe and record the re-establishment of native wetland plant species, such as *Spartina patens* and *Distichlis spicata*, in the absence of *Phragmites* (Project work conducted with previous employer).

Mill Creek Dump Site, Erie, PA - Directed the preparation and implementation of a 15-acre freshwater wetland mitigation project in Erie, Pennsylvania. This project involved oversight and planting of approximately 4,700 trees and shrubs of various species in cleared and graded areas suitable for wetland vegetation (Project work conducted with previous employer).

Dahlgren Naval Base, Dahlgren, VA - Completed the enhancement of wetland areas surrounding a recently closed landfill at the base. This project involved oversight and planting of 4,220 herbaceous plants and shrubs of various species in wetland areas and cleared and graded areas suitable for wetland vegetation around a remediated landfill mound (Project work conducted with previous employer).

Environmental Impact Statements/Waterfront Development Permits/Coastal Permits

Environmental Impact Statements were prepared for proposed residential, retail, and/or agricultural developments in the following New Jersey municipalities: Boonton Township, Borough of Chester, Harding Township, City of Plainfield, Mount Olive Township, and Saddle Brook Township.

Hoboken Cove Project, Hoboken, NJ – Prepared an application for a Waterfront Development Permit associated with the proposed continued redevelopment of the Hoboken Cove properties. The redevelopment consisted of a rental apartment complex with ancillary parking structures and a small retail development.

Ocean County Utilities Authority (OCUA), Bay Head, NJ – Prepared an application for an NJDEP Coastal General Permit, and for U.S. Army Corps of Engineers Nationwide Permits 3 & 7 for the reconstruction of a legally existing functioning bulkhead. The 65-foot section of bulkhead is located at the OCUA NPS-7 Pumping Station along Scow Ditch in Bay Head. Attained a One-Fee Tidelands License, and a Regular Tidelands License from the NJDEP Bureau of Tidelands for the proposed project.

Site Investigation/Sampling Experience

Great Swamp National Wildlife Refuge, Harding Township, NJ - Conducted semi-annual ground-water, surface water, and sediment sampling during initial monitoring period of the OU-3 Landfill remediation project. (Project work conducted with previous employer.)

Freshkills Landfill, Staten Island, NY – Assisted with annual surface-water and sediment sampling activities in different sections of the Arthur Kill and its tributaries surrounding the landfill. (Project work conducted with previous employer.)

Sweet Lake, LA - Conducted a qualitative ecological assessment of a freshwater lake in Sweet Lake, Louisiana. In addition to noting the indigenous flora and fauna of the area, sediments were collected for a

benthic macroinvertebrate population characterization. The sediments were screened and examined, and organisms present in the sediments were categorized and counted. The data was gathered to assist efforts for a wetland terracing creation project. (Project work conducted with previous employer.)

Honeywell Coke Plant Superfund Site, Ironton, OH – Conducted annual vegetation sampling and sediment sampling for benthic macro-invertebrate analysis in lagoon area of coke plant. Transects and observation plots were set up throughout the lagoon area of the site. Dominant vegetation and percent cover were noted at all observation plots. Sediment sampling locations were also established where transects passed through areas with standing water. Results were compared with vegetative communities and samples taken from two nearby reference locations. Different biometrics and comparative indices were calculated in order to compare vegetative and benthic site communities to reference communities.

Training/Certifications

Pond Design, Management, and Maintenance, Cook College, Rutgers University, November 2006.

Ecological Risk Assessment: Practice and Protocols, Cook College, Rutgers University, March 2006.

Vegetation Identification for Wetland Delineation-Winter, Cook College, Rutgers University, November 2005.

Hydrology of Wetlands, Cook College, Rutgers University, May 2005.

Advanced Hydric Soils, University of Massachusetts at Amherst, June 2003.

New Jersey Calling Amphibian Monitoring Program Training, New Jersey Division of Fish & Wildlife, Endangered & Nongame Species Program, January 2003.

Fundamentals in Geographic Information Systems, Cook College, Rutgers University, September-October 2002.

Freshwater Wetlands Construction Techniques, Cook College, Rutgers University, May 2001.

Methodology of Delineating Wetlands, Cook College, Rutgers University, May 2000.

Vegetation Identification for Wetland Delineation, Cook College, Rutgers University, May 2000.

Hydric Soils for Wetland Delineation, Cook College, Rutgers University, May 2000.

Environmental & Ecological Risk Assessment for Hazardous Waste, Cook College, Rutgers University, March 1999.

Natural Attenuation of Chlorinated Solvents in Ground Water Training Course, March 1998.

New Advances in Ecological Risk Assessment Seminar, Nicholas School of the Environment, Duke University, March 1996.

40-hour OSHA Hazardous Waste Training (OSHA 29 CFR 1910.120).

American Heart Association Heartsaver First Aid, Adult CPR & AED Training (current).

Projects/Presentations

Page, D., Prann, R. W., Koutouzakis, C. S., Lidzbarski, J., "The Influence of Hydrology on Wetland Vegetative Diversity in a Created Wetland Mitigation Bank", Oral presentation given by D. Page at The Society of Wetland Scientists Annual Meeting, New Orleans, Louisiana, 2003.

Koutouzakis, C. S., Froonjian, A., Prann, R. W., Seman, M., "Planning for and Dealing with Threatened and Endangered Species: The Effects of the Endangered Species, *Clemmys muhlenbergii*, on Fiber-Optic Network Constructions", Oral presentation given by C. Koutouzakis at The IT Group Exchange, Philadelphia, Pennsylvania, 2001.

Koutouzakis, C.S., "Herbicide/Soil/Plant Interactions", Nicholas School of the Environment, Duke University, Durham, North Carolina, 1996.